EA-Southern LEAPs

Box 5

local environment agency plan

NEW FOREST

CONSULTATION REPORT

APRIL 1998

ENVIRONMENT AGENCY

New Forest Key Details

General

Area	450.49km²
Coastline	52km

Administrative Details

Local Authorities: % of Area

New Forest District Council	>99%
Christchurch District Council	< 1%
County Councils : Hampshire, Dorset	

Population *(1995 NFDC Parish estimates)*

YEAR	POPULATION
1995	105,000

Water Resources

Average Annual Rainfall 741-846mm

Number of Licensed Abstractions

Surface Water	25
Groundwater	31

Water Companies

Southern Water Services
Bournemouth & West Hampshire Water

Conservation

Sites of Special Scientific Interest	12
Special Areas of Conservation	1
Special Protection Areas	1
Ramsar Sites	1
National Nature Reserves	1
Local Nature Reserves	2
Areas of Outstanding Natural Beauty	1

Fisheries

Length of EC Designated Fisheries (km):

Freshwater Salmonid	17.83

Water Quality

Freshwater River in NWC Class (km):

Class	Objective	Achieved 1990 Survey	GQA	(km)
1A Good	45.1	89.1	A	31.3
1B Good	110.8	88.6	B	98.9
2 Fair	34.4	12.6	C	45.4
3 Poor	0	0	D	8.7
4 Bad	0	0	E	2.5
Total	**190.3**	**190.3**	**Total**	**186.8**

Number of EC Designated Bathing Waters 5

Pollution Prevention & Control

Landfill Sites (Inert)	8
Landfill Sites (Biodegradable)	4
Waste Treatment/Processing Plants	2
Metal Recycling Stations	2
Incinerators	1
Transfer Stations	6

Integrated Pollution Control Authorisations

Discharges to Air	23
Effluent Discharges	8

Flood Defence

Coastline *including main tidal waters*	108.3
Main River *including tidal lengths*	155.9
Sea Defences *Agency responsibility*	10.47

YOUR VIEWS

The New Forest LEAP Consultation Report is the Environment Agency's initial analysis of the state of the water, land and air environment in this catchment. The evaluation of the state of the environment was achieved not only by drawing on experts and data within the Agency but also by early informal liaison with a number of key external organisations. This Consultation Report is intended to encourage comments from the users in the catchment.

The issues and actions have been reviewed and prioritised by a stakeholder group, who have an interest in what happens in the area, using an appraisal technique to incorporate consideration of the costs and benefits of each action.

We would now like to hear all your views to help us develop an Action Plan

- Have all major environmental issues been identified?
- Do you agree with the ranking of the issues?
- Have all the options and solutions to the issues been identified?
- In what way can you or your organisation work in partnership with the Agency to improve the New Forest Area?

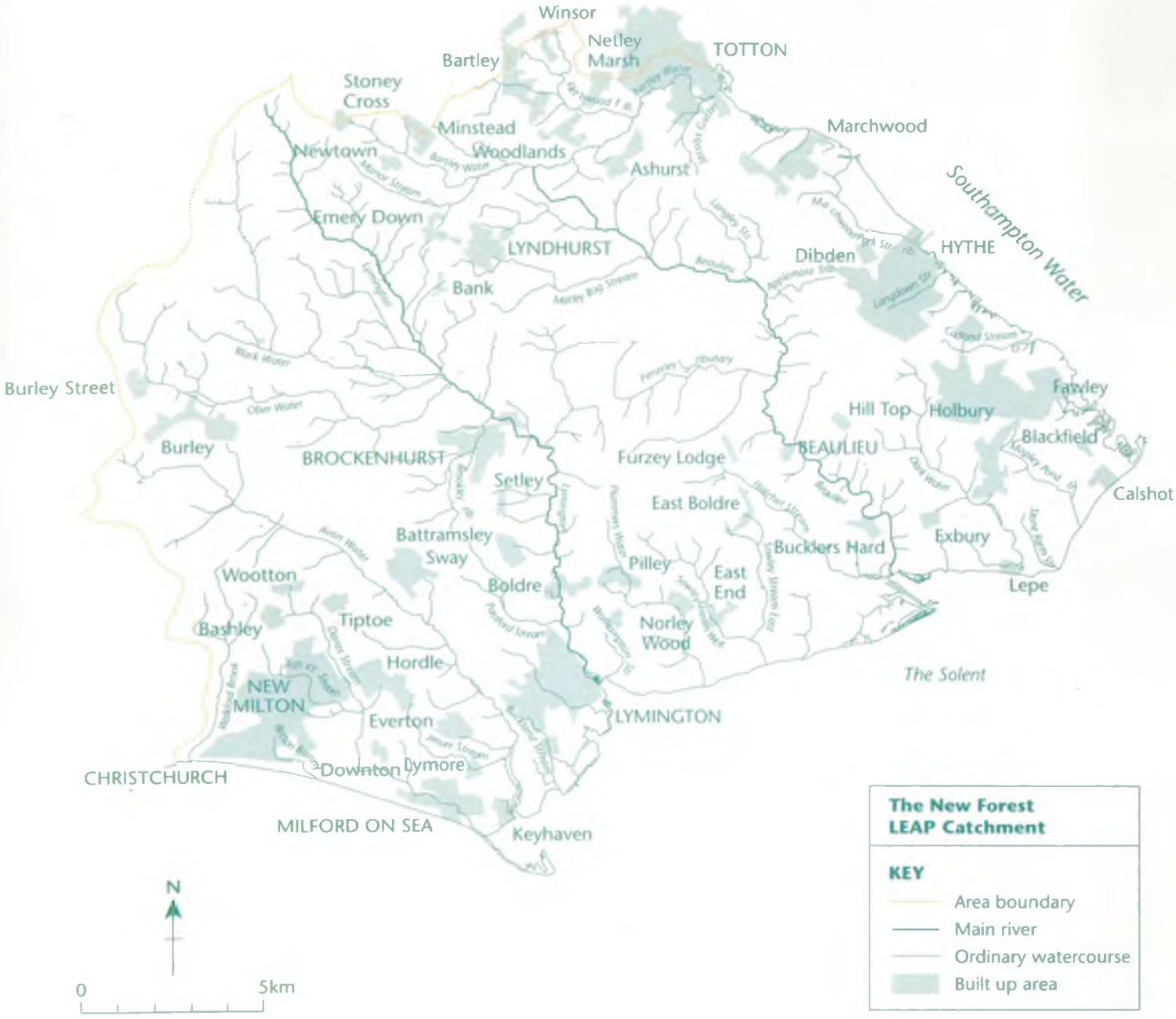
Please send any comments in writing to:

Mat Carter
Area Customer Services Manager
The Environment Agency
Southern Region - Hampshire and IOW Area
Sarum Court
Sarum Road
Winchester
Hampshire
SO22 5DP

All comments must be received by 30 June 1998

All comments received will be treated as public information unless you explicitly state otherwise in your response.

Catchment Overview



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New Forest Local Environment Agency Plan
April 1998

Foreword

LOCAL ENVIRONMENT AGENCY PLANS (LEAPs) seek to provide an integrated approach to environmental management, which is fundamental to the Agency's aim of protecting and improving the environment for present and future generations.

This report starts the formal consultation process with customers, the local community and interested organisations in arriving at an agreed plan for the New Forest area.

We have identified key environmental issues affecting the New Forest area in consultation with various organisations and bodies, including a stakeholder group comprising representatives from the private, public and voluntary sector with an interest in the area. The group prioritised the issues taking into account the likely costs and benefits of each proposal. I would like to take this opportunity to thank all those key organisations and individuals who contributed to this plan, and in particular the stakeholder group who devoted their valuable time to help us better understand the views of the local community.

We now need to confirm that we have identified all of the issues and the options to resolve them. Some of them may not be clear cut – some groups may be adversely impacted by some of the proposals – and many of the issues raised in this report can only be resolved through the actions of others.

To ensure that we achieve a balance between the conflicting demands placed upon our natural environment, we need to work in partnership with individuals, pressure groups, those we regulate and other organisations. For this reason we are seeking your views so we can achieve consensus on the issues and proposed actions and improve the environment of the New Forest area.

Please comment – your views are important

Peter Quarmby

Area Manager – Hampshire and Isle of Wight

Southern Region

DRAFT VISION FOR THE NEW FOREST CATCHMENT AREA

The New Forest Catchment Area is unique in character with both national and international conservation designations, but it is also host to a wide variety of uses including recreation, tourism, agriculture and industry.

The Agency's Vision for the New Forest Catchment Area is to ensure that its distinctive character as an area of major environmental significance is sustained and enhanced. We will work closely with others, recognising the diversity of interests which exist and the need to consider the impact of any decisions on the environment taken as a whole

To achieve this the Agency will aim to:-

- Maintain all Main Rivers to preserve and enhance their environmental quality whilst providing an appropriate level of flood defence.
- Take a leading role in actions outlined in the Shoreline Management Plan to provide, with others, sustainable coastal defences.
- Safeguard and improve the fisheries within the New Forest rivers, streams and lakes.
- Further and promote the conservation of flora and fauna, enhance biodiversity and contribute to the protection of important natural and archaeological features.
- Contribute to sustainable recreation.
- Maintain and, where necessary, improve the physico-chemical and biological quality of surface, ground and tidal waters and ensure compliance with UK and EC legislation.
- Balance the growing demand for water resources with the ecological interests of existing streams and wetlands, and support the restoration of degraded wetland habitats.
- Work with others to ensure that the quality of the air in the area meets or exceeds all current and future regulatory standards.
- Promote schemes to minimise, reuse or recycle waste and regulate disposal in order to provide environmental protection.
- Form new partnerships with others to achieve common environmental goals within the New Forest Area including contributing to Agenda 21.
- Promote sustainable development.

Chapter 1

The Environment Agency

This chapter provides an introduction to the Environment Agency.

CHAPTER 1: THE ENVIRONMENT AGENCY

1.1 Who Are We?

The Environment Agency is a non-departmental public body charged with safeguarding and improving the environment, water, land and aspects of air quality. The Environment Agency combines and improves the functions of its predecessor bodies: the National Rivers Authority (NRA), Her Majesty's Inspectorate of Pollution (HMIP), the Waste Regulation Authorities (WRAs) and some parts of the Department of the Environment (DoE). Bringing these bodies together enables the Agency to manage the environment in a more coherent and integrated manner.

The Agency's vision is a better environment in England and Wales for present and future generations. We are committed to improving wildlife habitats and conserving the natural environment, pollution control, flood defence, regulating waste disposal and industrial processes, protecting and improving fish stocks and regulating rivers and groundwaters.

1.2 Our Principal Aim

The Environment Agency's principal aim, as set out in the Environment Act 1995, is to protect or enhance the environment, taken as a whole, and to make the contribution towards attaining the objective of achieving sustainable development. This aim developed from the Agency's duty to follow the Government's overall environmental strategy set out in its 1994 report on the 1990 White Paper, 'This Common Inheritance' and in the 1994 UK Strategy for Sustainable Development.

1.3 Sustainable Development

In 1987 the World Commission on Environment and Development (the Bruntland Commission) defined sustainable development as that which:-

"meets the needs of the present without compromising the ability of future generations to meet their own needs".

One way for the Agency to contribute towards the attainment of the objective of sustainable development is through Local Environment Agency Plans (LEAPs). These plans are a means for the Agency to deliver environmental improvement at a local level and reflect the Agency's close contact with industry, the public and local Government.

1.4 Our Objectives

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

- An integrated approach to environmental protection and enhancement, considering the impact of all activities and natural resources.
- Delivery of environmental goals without imposing excessive costs on industry or society as a whole.

- Clear and effective procedures for serving its customers, including the development of single points of contact with the Agency.

- High professional standards, using the best possible information and analytical methods.

- Organisation of its own activities to reflect good environmental and management practice, and provision of value for money for those who pay its charges, and for taxpayers as a whole.

- Provision of clear and readily available advice and information on its work.

- Development of a close and responsive relationship with the public, including local authorities, other representatives of local communities and regulated organisations.

1.5 How We Are Structured

The Agency has a Board of up to 15 members appointed by the Department of the Environment Transport and the Regions (DETR), the Ministry of Agriculture, Fisheries and Food and the Welsh Office and includes the Agency's Chairman and Chief Executive.

The Agency is split into eight Regions covering England and Wales. Every Region has three statutory Regional Committees each of which includes local authority and business representatives. The three Committees are:-

- Regional Environmental Protection Advisory Committee (REPAC)
- Regional Flood Defence Committee (RFDC)
- Regional Fisheries Advisory Committee (RFAC)

Committee meetings are open to the public and the media.

Eight Directors provide overall management of the Agency's work and are based at our Head Office in Bristol with supporting offices in London. Regions are split into three or four Areas, making a total of 26. Each Region has a Regional General Manager and each Area has an Area Manager.

The Hampshire and Isle of Wight Area of the Southern Region is also served by its own advisory, non-statutory, **Area Environmental Group**. Membership consists of local people who live and work in the area and who represent a range of interests. These include local authorities, industry, agriculture, conservation, fishing, amenity and recreational interests. The group advises the Agency on LEAPs, the importance of other local environmental issues and on the delivery of local services. It acts as a link between the local community, the Agency and its statutory committees.

1.6 What We Do

Our work is divided into seven main functions:-

Flood Defence has the role of protecting people and the developed environment from flooding by providing effective defences and through the protection of floodplains. Safeguarding life is our highest priority and to meet this aim we provide a flood forecasting and warning service. Flood Defence also aims to protect and enhance the natural environment by promoting works that are sustainable and work with nature.

The ***Water Resource*** function comprises the conservation, redistribution and augmentation of surface and groundwater supplies. In order to ensure these resources are developed in a sustainable manner, it encourages water conservation, promotes transfer schemes and tries to balance the needs of water users and the environment by issuing licences for users to abstract water from rivers and boreholes. A network of hydrometric recording stations is maintained to assess water resources on the basis of rainfall, river flows and levels and groundwater levels.

The ***Pollution Control*** function includes:-

- **Integrated Pollution Control** (IPC), regulating the most polluting, or technologically complex, industrial and other processes in air, on land or in water. Control is exercised through application of the principle of Best Available Techniques Not Entailing Excessive Cost (BATNEEC). For new processes, control is exercised through the principle of Best Practicable Environmental Option (BPEO). This approach is to be extended under the recently agreed EU Directive on Integrated Pollution Prevention and Control (IPPC).

- **Water Quality** and pollution control which prevents and controls pollution and monitors the quality of rivers, estuaries and coastal waters. Pollution control is applied through EC legislation and UK Regulations. Most of the Agency's powers with respect to water quality and pollution control are defined in the:-

    - Water Act 1989
    - Environmental Protection Act 1990; and
    - the Environment Act 1995.

- **Radioactive Substances** (RAS), regulating the keeping and use of radioactive materials and accumulation of radioactive waste (except on nuclear licensed sites); regulating the disposal of radioactive wastes from all sites.

- **Waste Regulation**, setting consistent standards for waste management practice to regulate the treatment, storage, movement and disposal of controlled waste. The waste hierarchy (reduction, re-use, recovery, disposal) ranks waste management options in terms of their relative sustainability. It is Government policy to increase sustainability by moving the management of waste up the hierarchy. The Agency has an important role in achieving this policy through its waste regulation and research function. The Agency will in future also have a requirement to register and monitor those businesses which manufacture, fill or sell packaging materials, imposing obligations to recover and recycle set tonnages.

- Reporting on the extent of **contaminated land** and contributing to its management (primarily undertaken by local authorities).

The Environment Agency is responsible for maintaining, improving and developing ***Fisheries***. This is carried out by licensing, regulation and enforcement schemes which cover salmon, sea trout, non-migratory trout, coarse and eel fisheries. The Agency also carries out improvements to fisheries by improving the habitat, fish stocks and providing advice to fishery owners.

The ***Navigation*** function is responsible for managing and improving inland waterways where the Environment Agency is the Navigation Authority. Its aim is to make these resources widely available to the public for water or land-based recreational use. The Environment Agency is not a Navigation Authority in the New Forest Catchment Area.

The Agency must also take account of ***Recreation*** and access in fulfilling its other functions. Nationally, over 1,000 sites in our control are managed for recreational use. We also have a general duty to promote the recreational use of water and land throughout England and Wales to the extent that we deem desirable.

There is an overarching duty on the Agency's functions to contribute to the ***Conservation*** of nature, landscape and archaeological heritage. The Agency must have regard to conserving and enhancing flora, fauna, geological or physiographical features when carrying out pollution control functions, and a duty to further conservation when carrying out other functions. We also have a duty generally to promote the conservation of flora and fauna which are dependent on the aquatic environment. The Agency also plays a full part in protecting and enhancing the UK's biodiversity. In order to meet these obligations, Agency conservation staff are consulted on the majority of consents/authorisations and internal plans and proposals made by the Agency. Biological Quality Assessment forms an integral part of the Agency's Environmental Impact Assessment capability. The Agency must also have regard for the economic and social well-being of local communities in rural areas in undertaking its functions.

1.7 What We Do Not Do

The Environment Agency does not cover all aspects of environmental legislation and service to the general public. Your Local Authority deals with the majority of noise problems, litter, and air pollution arising from vehicles, household areas, small businesses and small industries.

Planning permission is the responsibility of your Local Authority who will contact the Environment Agency when necessary. Other drainage authorities deal with flooding problems on non-Main Rivers under the general supervision of the Environment Agency.

Environmental Health issues should also be directed to your Local Authority - details can be found in your local telephone directory.

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1.8 Who Are Our Customers?

The Agency has a wide range of customers. In the broadest sense, the general public are our customers but some of them pay us directly for specific services which nationally include:-

> *over 2,000 industrial processes, keeping and use of radioactive materials at 8,000 sites; 8,000 waste management sites and some 70,000 waste carriers; 100,000 water discharge consents including 6,000 sewage works, 50,000 licensed water abstractions, 43,000km of flood defence works, 1,000,000 angling licences and navigation licences for some 40,000 boats..*

Other customers receive services paid for indirectly through Government grants and taxation. These include the public and many businesses and representative groups that form part of our community, such as nature conservationists and farmers. The Agency also regards Government at the local, national and European level as customers, including over 500 local authority bodies.

1.9 Environmental Standards

These are set in European and UK legislation and the Agency has the responsibility for enforcing some of these standards within England and Wales.

There is a great deal of legislation that has an impact on the way the Environment Agency operates or the way we carry out our enforcement duties. The main legislation includes the following Acts:-

- Salmon and Freshwater Fisheries Act 1975
- Wildlife and Countryside Act 1981 (as amended)
- Control of Pollution (Amendment) Act 1989
- Environmental Protection Act 1990
  Part I (Integrated Pollution Control)
  Part II (Waste)
- Water Resources Act 1991
- Land Drainage Act 1991
- Water Industry Act 1991
- Radioactive Substances Act 1993
- Deregulation and Contracting Out Act 1994
- Environment Act 1995

The Agency is also the 'Competent Authority' for over 25 European Community environmental Directives, whilst a further 70 Directives affect our policies and activities. For example, these include:-

> *Drinking Water, Bathing Water, Nitrate, Habitats and Species, Birds, Dangerous Substances, Industrial Plant Emissions, Waste Management Framework, Packaging and Packing Waste, Quality of Water to Protect Freshwater Fisheries and Urban Waste Water Treatment, Shellfish Waters, Shellfish Hygiene*

Details of all new legislation, bylaws and statutory instruments affecting the Environment Agency are given in our Annual Report and Accounts.

The Agency also operates non-statutory standards such as our informal river quality objectives that are aimed at particular stretches of river and estuary and you will find details about these in this plan.

1.10 Operational Standards

Operational Standards cover our technical, scientific and engineering procedures which are necessary to put European and UK legislation and Environment Agency policy into practice.

These standards take many forms, including policy statements, procedural manuals and a suite of quantitative output and performance measures that we monitor quarterly and, in some cases, annually. Details of our operational standards are published in technical handbooks, research and development reports and information leaflets. Further details are available from the contact given at the front of this plan.

1.11 Internal Environmental Policy

The Agency operates its own environmental policy. This includes recycling, waste minimisation and energy efficiency schemes covering all of our activities across England and Wales.

We aim to ensure that our own actions do not cause damage to the environment and that the resources we use are managed in a sustainable fashion. Our results are published as part of our Annual Report and Accounts.

1.12 Public Registers and Access to Environmental Information

The Environment Agency maintains many public registers which can be inspected at most Environment Agency offices free of charge. The main public registers cover:-

Integrated Pollution Control (IPC) - holding information on industrial processes regulated under the IPC regime. The Chemical Release Inventory (CRI) has information on releases from these processes. The IPC register is also held by local councils for the relevant processes.

Radioactive Substances - with information relating to the use, accumulation and disposal of radioactive materials and waste. The register is also held by local councils for the relevant premises.

Water Quality and Pollution Control - containing information on discharge consents, water quality sample results and maps of freshwater limits and controlled coastal waters.

Water Abstraction and Impounding - holding information on water abstraction and impounding licences.

Waste - with Waste Management Licensing information relating to sites for the recovery or disposal of waste and details about carriers and brokers of waste.

In addition the following information also exists:-

- ***Genetically Modified Organisms (Deliberate Release) Register***. This is produced by the Department of the Environment Biotechnology Unit and is made available through the Environment Agency at most regional offices.

- ***Local Authority Air Pollution Control (LAAPC)*** authorisations. Details are available from your local District Council. ***Register of Industrial Works (Air Register)***. These are being incorporated into the Agency's Integrated Pollution Control scheme.

- ***Works Discharge Register*** - with information on premises which abut watercourses.

- ***Special Waste Notifications*** - with consignment notes on the disposal and location of waste.

The Agency also holds a variety of environmental information which can be obtained from the Hampshire and Isle of Wight Area office.

Chapter 2

This Report And Its Purpose

This chapter describes the need for LEAPs and the process of their production.

CHAPTER 2: THIS REPORT AND ITS PURPOSE

2.1 The Need for LEAPs

The Department of the Environment has prepared guidance for the Environment Agency, under the requirements of the Environment Act 1995, which sets out the means by which the Agency can contribute to sustainable development. (See paragraph 1.3 above for an explanation of sustainable development). The Local Environment Agency Plan (LEAP) is the Agency's response to this guidance and is intended to be both a management tool for all of our functions and a means of promoting partnerships with other organisations.

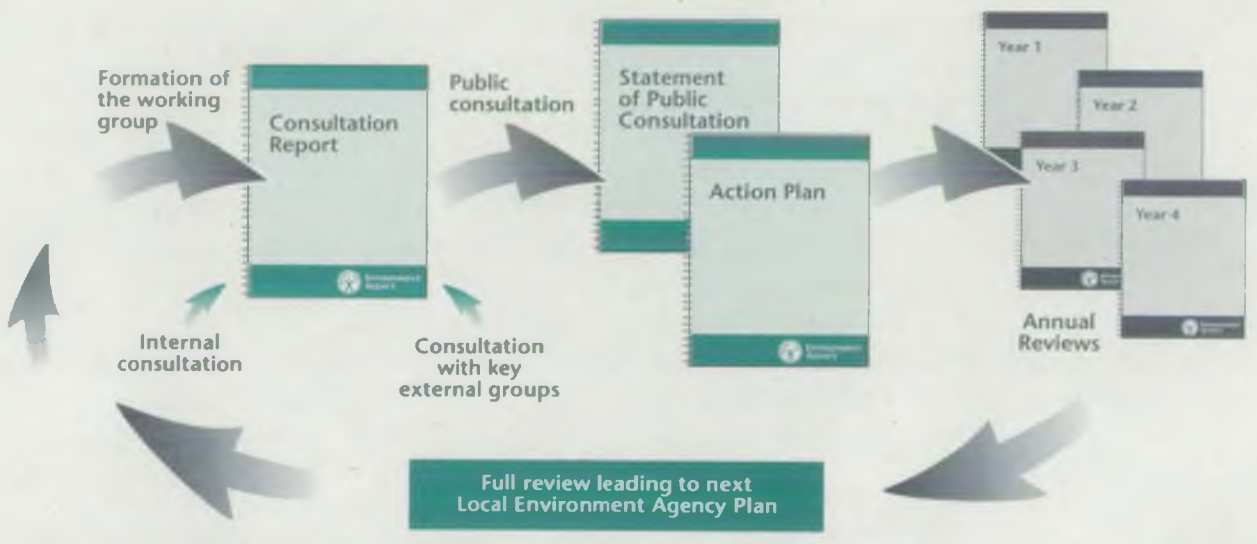
2.2 The LEAP Process

2.2.1 By means of an extensive consultation process it is intended that the Agency will establish a common vision for environmental objectives, together with a consensus view on the strategy needed to guide all future tactics and actions. Preliminary consultation has already taken place with key local organisations and this document is intended to be the means by which the consultation exercise can be extended as widely as possible.

2.2.2 The Agency will collate all of the responses to this Report and prepare a Summary of Consultation which will be distributed to all respondents of the Consultation Report and will be made available to any other interested parties. The Action Plan, setting out the strategic policies for the management of the local environment and the short-term actions towards implementing these policies, will be published in November 1998.

2.2.3 The Agency will review the progress of identified actions and produce an annual update report which may also, if necessary, report upon any significant new environmental issue arising within the catchment. A major review of progress will be published within five years of production of the Action Plan.

The LEAP Process



2.3 The Consultation Report

This Local Environment Agency Plan (LEAP) Consultation Report is the first output of the LEAP process for the New Forest catchment, and is not the final Plan. It will give you the opportunity to comment on environmental problems or the work of the Agency. In particular it:-

- describes some of the key environmental characteristics of the area;
- explains how the environment is affected by human uses, activities and pressures;
- outlines issues where the Environment Agency or others need to take action to address problems in the environment; and
- consults on options for those actions.

The Consultation Report comprises the following key sections:-

Description and Characterisation of the Plan Area (Chapter 3)

This chapter provides a brief and general introduction to the plan area.

Issues List (Chapter 4)

This is a summary of the environmental issues which arise from consideration of the catchment characteristics and the uses and pressures within it. Details are given in Chapter 8.

Protection Through Partnership (Chapter 5)

This chapter explores some of the areas for actual and potential partnership ventures.

Human Uses, Activities and Pressures on the Catchment (Chapter 6)

Society places evermore demands on the environment but expects it to be protected from harm. This chapter looks at the main uses and activities in the area and the pressures that are put on the environment.

Targets and the State of the Environment (Chapter 7)

This chapter looks at different aspects of environmental media such as air, water and land and considers what standards are available to allow us to assess the state of the environment within and between these media.

Environmental Issues to be Addressed (Chapter 8)

Shortfalls and other environmental problems are described as Issues, and options for their resolution are proposed for consultation.

Your comments and views on any of the matters discussed in this document will be particularly welcomed.

Please send your response in writing to the Customer Services Manager at the address given on the cover of this report by 30th June 1998.

2.4 **LEAPs and Development Plans**

While the Agency can control some of the things which influence the quality of the environment we have only limited control over the way that land is developed. This is the responsibility of local planning authorities. However, planning authorities have little control over agriculture or Ministry of Defence (MOD) developments, although MOD is moving towards consultation in the planning process.

Local authorities prepare statutory development plans which cover a five year period. The policies in these plans will guide the way that land is developed in the future. The Agency advises local planning authorities to encourage them to adopt policies which protect the environment from development which may be detrimental. Where possible the Agency will reinforce these policies when commenting on planning matters or if we are making our own decisions, and work in partnership towards achieving sustainable development. This Report will aim to highlight where the Agency is concerned about development.

2.5 **LEAPs and Catchment Management Plans**

This LEAP is continuing and expanding the philosophy of Catchment Management Plans (CMPs). All existing CMPs will be replaced by LEAP Consultation Reports by the end of December 1999 which will ensure complete coverage of England and Wales. LEAPs are designed to provide an integrated Management Plan and will cover the same topics as Catchment Management Plans but they will also deal with new topics to cover the full range of the Agency's responsibilities. These are Integrated Pollution Control, Waste Regulation and Radioactive Substances Regulations. The Agency aims to have a series of LEAP Consultation Reports covering the whole of England and Wales by 31 December 1999.

Chapter 3

Description and Characterisation of the Plan Area

This chapter provides a brief and general introduction to the plan area.

CHAPTER 3: DESCRIPTION AND CHARACTERISATION OF THE PLAN AREA

3.1 General Description

3.1.1 This Local Environment Agency Plan (LEAP) covers the area of land drained by the streams and rivers which flow into the west side of Southampton Water and into the western Solent. The total area of this land (known as the catchment) is 450.49km² and it includes 52km of the Hampshire coast from Redbridge at Totton to Chewton Bunny near Barton-on-Sea. The LEAP area is shown on Map 1. Drainage of the area is dominated by two Main Rivers - the Lymington River and the Beaulieu River - and a number of other watercourses serving the LEAP catchment.

3.1.2 The catchment is predominantly rural with the principal urban areas confined to the south-west coastal zone - Barton, Milford and Lymington and to the Waterside - Marchwood, Hythe, Holbury and Blackfield. Other settlements comprise the southern margins of Totton in the north and the Forest villages of Lyndhurst, Brockenhurst and Sway. The total population of the catchment is estimated to be approximately 105,000 (source - 1995 Parish estimates, New Forest District Council). This LEAP covers a large proportion of the New Forest Heritage Area; the remainder of the Heritage Area, principally in the north and west, is to be covered by the River Avon LEAP, which is to be prepared by the Agency's South-West Region in mid-1998. We will ensure full liaison on this Plan between our two Area offices.

3.1.3 The LEAP catchment lies almost entirely within the administrative area of New Forest District Council, with the exception of a very small area in the south-west which lies within Christchurch District. Although this document is titled the New Forest LEAP, the catchment includes only around 70% of the Crown lands and about 60% of the whole New Forest Heritage Area (as defined by the New Forest Committee - February 1996). The Heritage Area, whose status is equivalent to National Park under Government policy, is designated by New Forest District Council as an area intended to ensure continuity of ecological habitats and to prevent development in adjacent areas which may have an adverse effect on the Forest.

3.1.4 The principal economic activities within the catchment are tourism, leisure, agriculture and the petrochemical complex and power station at Fawley. The population of the area increases dramatically in summer months, with the attendant pressures upon the New Forest habitats and the local highway system. The large estates in the south are agricultural and continue to be so; commoning is part-time and managerial agriculture associated with it may be reducing. The Fawley complex is an important local employer involving major long-term investment in plant which does, however, have the potential to impact upon aspects of the environment in the catchment. A wide variety of retail and small-scale manufacturing activities are also present in the area.

3.2 Geology; Soil and Land Use

3.2.1 The New Forest is located in the centre of a geological feature known as the Hampshire Basin. The Hampshire Basin comprises sands, silts and clays laid down in alternate marine, estuarine and freshwater environments some 30 to 40 million years ago. Subsequent to these deposits being laid down, sea retreat led to emergence of the land. During this period a thick blanket of more recent gravel and brickearth was laid down over the whole area of the Basin. Much of the gravel and brickearth was subsequently removed by erosion to leave the characteristic gravel capped terraces of the New Forest. See Map 2.

3.2.2 The geology is therefore characterised by rapid changes both laterally and vertically between the clay, silt, sand and gravel lithologies. The New Forest has been described as a series of eroded flat terraces, highest in the north and lowest in the south. The middle terraces are scoured into wide hollows drained by the two south-flowing stream systems of the Lymington and Beaulieu Rivers which drain into the Solent. There is a wide variation in the texture and chemistry of the soils, which is reflected in the diversity of vegetation types across the Forest. Generally the soils are lowland acidic and productively poor soils which become richer and more productive towards the coastal margin with the Solent.

3.2.3. Land use within the New Forest LEAP area is varied and includes the following environments:-

- The unenclosed Forest of which a significant proportion is designated SSSI. Here the commoners' historical exercise of grazing rights has created and maintained the unique habitat.
- Forestry Commission plantations for soft and hard woods.
- Enclosures for agricultural small-holdings within the perambulation of the New Forest.
- Agriculture and estate farms on the fertile coastal margin.
- Urban areas on Southampton Water and Christchurch Bay.
- Industrial complexes (petrochemical and power generation) on Southampton Water.

3.3 Hydrogeology

3.3.1 The rapidly changing sequences of clays and sands means that there is no major aquifer in the LEAP area. The variable hydraulic properties of the clay, silt and sand strata strongly influence the rivers of the LEAP area with spring lines generally being found where there are exposures of peat or sand overlying impermeable clay layers.

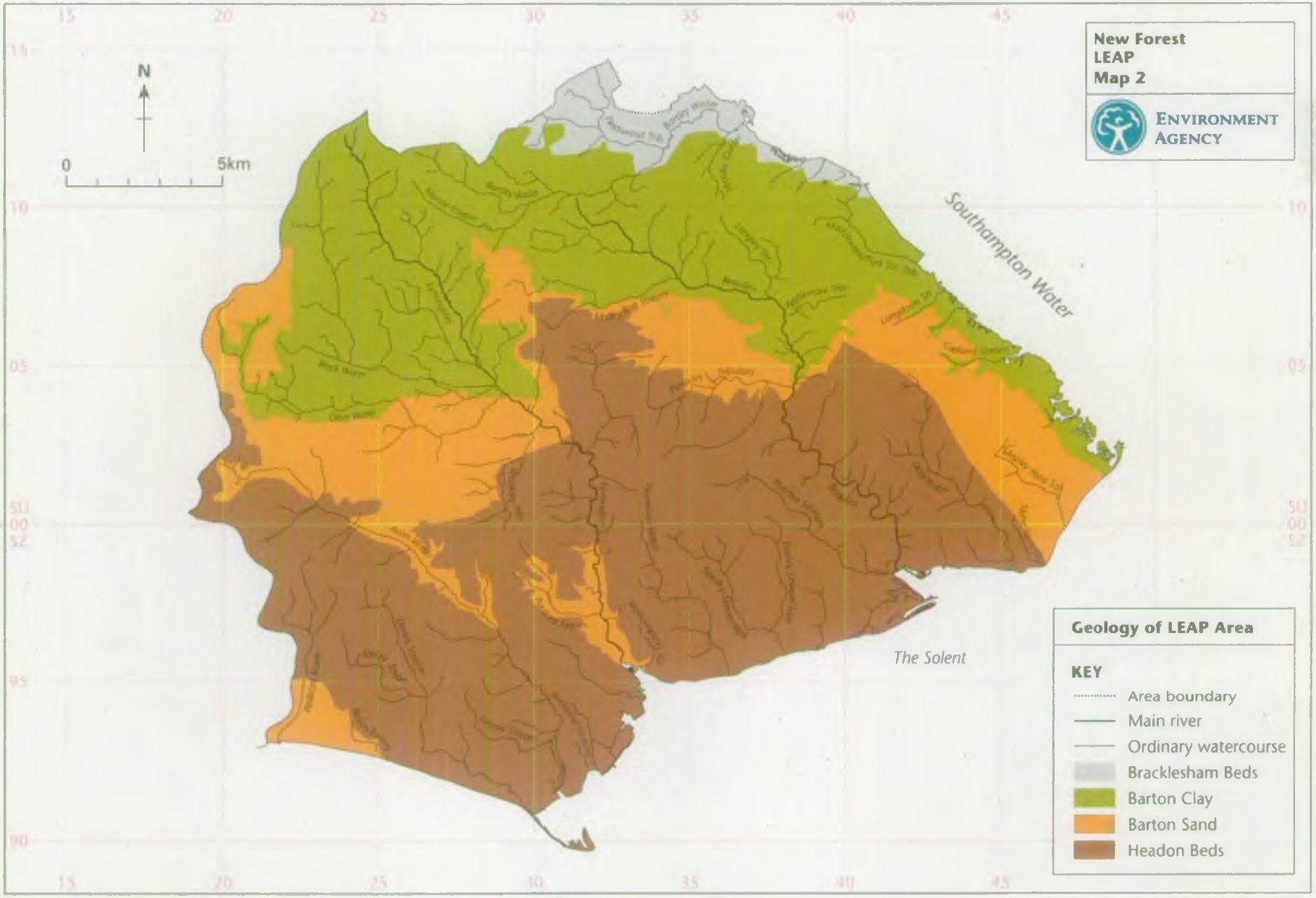

New Forest
LEAP
Map 2
Environment Agency
N
0
5km
Southampton Water
The Solent
Geology of LEAP Area
KEY
Area boundary
Main river
Ordinary watercourse
Bracklesham Beds
Barton Clay
Barton Sand
Headon Beds

Table 1 - Details of Rivers in the LEAP Area

PRINCIPAL WATERCOURSE	LENGTH (km)	TRIBUTARIES	LENGTH (km)
Walkford Brook	9.00	-	-
Danes Stream	9.00	-	-
Avon Water	18.50	-	-
Lymington River	15.00	Highland Water Fletchers Water* Ober Water Passford Water Etherise Gutter	9 10 9 10 8
Pennington Lake Stream	4.00	-	-
Crockford Stream	4.00	-	-
Beaulieu River	26.00	Rushbush Pond Stream Boarman Pond Stream Shepton Water Penerley Water	1 2 3 2
Dark Water	7.00	-	-
Hythe Streams†	6.00	-	-
North Dibden Stream	2.00	-	-
Bartley Water	12	Mill Stream Jacob's Gutter (16)	6 3
ORDINARY WATERCOURSE	**LENGTH (km)**		
Becton Bunny	3.00		
Plummers Water	10.00		
Thorns Stream	4.00		
Hatchet Water	6.00		
Stone Stream	2.00		
Bourne Stream◊	4.00		
Marchwood Streams	7.00		

* The upper reaches of the Fletchers Water are also referred to as the Black Water, Blackensford Brook and Bartley Water.

◊ Bourne Stream is also known as Mopley Pond Stream.

† The Hythe Streams network comprises two separate Main River watercourses.

3.3.2 The Bracklesham Beds comprise the oldest strata in the area and are classified as a minor aquifer. As the dip of the strata in the New Forest is predominantly to the south, the Bracklesham Beds have their outcrop in the north of the area and become progressively buried beneath younger strata further south. This minor aquifer is used both at its outcrop and where it is confined beneath overlying strata further to the south.

3.3.3 The Barton Clay overlies the Bracklesham Beds and the Barton Clay is overlain by the Barton Sands which, in a manner similar to the Bracklesham Beds, outcrops in the centre of the LEAP area before becoming confined further to the south.

3.4 Hydrology and the River Systems

3.4.1 The rivers of the New Forest Catchment Area consist of all those watercourses which discharge directly to either the Solent, Southampton Water or to Christchurch Bay (see Map 1). The New Forest LEAP rivers, their lengths and associated principal tributaries are shown in Table 1.

3.4.2 As the area is significantly underlain by relatively impermeable deposits, the drainage network density is relatively high, with many small streams throughout the New Forest area. Most of these watercourses flow in a south-westerly direction towards the Solent, gaining flow in places from the sandy horizons of aquifers. The streams in the Forest are generally of low volume, but they rise and flood very rapidly after heavy rainfall and can be described as 'flashy'. The streams with mires and bogs providing an element of storage in their catchments tend to have a higher base flow element and more consistent summer discharges than streams without these features. Many of the rivers and streams within the LEAP area have been modified by widening, deepening and/or straightening. This has resulted in a loss of habitat diversity, a loss of natural storm water attenuation features and mechanisms and a loss of traditional character in some rivers. Nevertheless, the New Forest streams are generally considered as some of the most natural watercourses in southern England.

3.5 Water Quality

3.5.1 The natural water quality of the New Forest streams reflects the underlying geology of sands, gravel and clay bands. Typically, therefore, the stream waters of the New Forest are base-poor with low nutrient concentrations. At or near to the source of many streams the waters are acidic, due to the presence of humic acids derived from bogs and valley mires. Typical pH values for New Forest streams are 5.9 to 7.3 though surveys have shown values as low as pH 4.2 (acidic) in small streams. In general, stream waters in the New Forest are poor in phosphates. Highest concentrations generally occur in urbanised areas and settled sites (enclosures). Iron deposits are often found in stream beds at the outflow point of springs as the result of the rapid oxidation of dissolved iron in the water.

3.5.2 The naturally nutrient poor nature of the New Forest waters is of critical importance in maintaining the unique biodiversity of the riverine and aquatic habitats.

3.5.3 The combination of naturally nutrient poor water and variable flow rates makes the New Forest streams poor receiving waters for waste water discharges. Waste waters typically contain elevated concentrations of nutrients such as phosphates and nitrates, so it is important that waste waters discharged to New Forest streams are as near to the receiving water quality as possible.

3.6 Climate

3.6.1 The climate of the New Forest LEAP area is moderately warm and wet for Britain with a relatively low incidence of frost and snowfall. The mean annual temperature varies from 9°C inland to 10.5°C on the coastal belt and winds are predominantly from the south and west. Average annual rainfall in the LEAP area for the period 1961 - 1990 was 741mm at Barton-on-Sea and 846mm at Brockenhurst. This is less than the

average annual precipitation for higher ground in the county which exceeds 1,000mm at Butser Hill ridge and the Hangers north of Petersfield. Even so, proximity to the coast creates mild, humid conditions which are a significant element to the New Forest's climate and which help to maintain the area as a stronghold for oceanic-southern plant species.

3.7 Air Quality

3.7.1 The LEAP area is affected by airborne pollutants from a number of towns, several busy roads and various industrial sources within its boundary, as well as from surrounding areas, especially Southampton, all of which are added to the background created by emissions elsewhere in the UK and Europe. The main pollutants are nitrogen dioxide, sulphur dioxide, particulate matter less than 10 micrometres in diameter (PM_{10}), ozone and odours. Regulation of air quality is the responsibility of a number of organisations. Central Government sets the framework for air quality control and deals with international measures, as described in 'The United Kingdom National Air Quality Strategy' (adopted March 1997). The Strategy gives Local Authorities responsibility for implementing local air quality management. The Agency is responsible for implementing Integrated Pollution Control (IPC) and for the licensing of waste management facilities. There are 23 Part A processes authorised under IPC, all concentrated along the eastern side of the LEAP area.

3.8 Habitats, Species and Conservation Areas

3.8.1 Ecologically, the LEAP area can be broadly divided into three distinct parts - the Crown Land of the New Forest, the farmlands to the south, and the coastal zone. The coastal zone includes the western shore of Southampton Water and the coast of the north west Solent, stretching from Calshot Spit in the east to Walkford Brook, Highcliffe at the western extreme. The area as a whole forms part of the zone defined by the Countryside Commission and English Nature as the New Forest 'Natural Area', sharing a coherent heritage of wildlife, natural features, and cultural history. Most of this is now described as the New Forest Heritage Area.

Crown Lands of the New Forest

The New Forest & The Forest Fringe

3.8.2 The Crown Lands of the New Forest are the primary example in lowland Britain of an extensive grazed common containing many of the physical elements of the medieval forestal system, with ancient unenclosed pasture woodlands, heaths and mires, together with enclosed meadows. The open (i.e. legally unenclosed) Forest comprises a habitat mosaic of ancient semi-natural vegetation with areas of dry, humid and wet heath, valley and seepage step mires and ancient oak, beech, holly and alderwoods, including riparian and bog woodland.

3.8.3 All of the New Forest has a long history of human use. Most of the present heathland was farmed in prehistory; there are relics of Roman pottery industries, and many of the present settlements started as Saxon farm clearances, whilst in Norman times, the Forest's woods and heaths were an extensive royal hunting ground. This complex history has shaped the landscape character of the Forest.

3.8.4 The small settlements, and areas of enclosed farmland which punctuate the extensive tracts of open heathland become increasingly more frequent towards the periphery of the Crown Land, where the landscape comprises small farmsteads characterised by small meadows remaining from medieval enclosures formed by 'assarting'.

New Forest Heathland

3.8.5 Much of the remaining heathland in Europe exists in the New Forest and East Dorset. The heathland vegetation of the Forest is open in character and includes grass heaths and acid grasslands as an integral part of the overall habitat type. The composition of the vegetation type is related to soil structure, associated permeability and grazing pressure. Hydrological and pedological influences produce a variety of heathland communities which vary from wet heath, through to humid heath and dry heath.

New Forest Mires

3.8.6 The Forest contains approximately 90 valley mires within about 20 different valley systems. This resource is thought to represent more valley mires than survive in the whole of the remainder of Britain and north western Europe.

3.8.7 Base-poor, acid valley mires with associated seepage step mires around the margins of the gravel plateaux form the predominant mire type. Associated with these mires are characteristic patterns of vegetation zonation which are influenced by the hydrological gradients of the mire and which are therefore very vulnerable to change in hydrological regime. These patterns of zonation give rise to a great diversity of species, with the richest mires supporting up to 150 species of plant, including the rare bog orchid (*Hammarbya paludosa*), and many rare invertebrates. The wetlands and mires of the New Forest are the UK stronghold for the southern damselfly (*Coenagrion mercuriale*), Britain's rarest damselfly. Also dependent on this kind of wetland habitat is the black bog ant (*Formica candida*) which has significantly declined in the New Forest. The Agency has special responsibilities for both of these species under the UK Biodiversity Action Plan. *Tachys edmondsi* is a ground beetle which lives amongst the *Sphagnum* bog mosses growing on New Forest mires. An endemic to the UK, this species has not been recorded for 20 years. Should it be rediscovered the Agency will again have special responsibilities to secure its conservation under the UK Biodiversity Action Plan.

New Forest Woodland

3.8.8 The unenclosed 'Ancient and Ornamental' woodlands are dominated by oak and beech in varying proportions. Holly is the predominant shrub layer species. The number of tree species is higher in linear riverine woodland where ash is abundant and carrs of alder and sallow are common. These riverine woodlands are of European conservation importance. The woodland ground flora is rich in plants characteristic of ancient woodlands, as well as many rare and vulnerable species of mosses and lichens.

3.8.9 The Forest streams, mires and abundant wet flushes along spring lines help to create a humid micro-climate which provides the right conditions for epiphytic lichens, bryophytes and ferns. Many of the epiphytic lichens also require the semi-open woodland conditions with high light levels associated with ancient, fairly open grazed woodlands, and some species require ancient trees.

3.8.10 The abundant dead wood associated with the forest floor and along watercourses is of major importance as a micro-habitat for fungi and invertebrates, many of which are virtually confined to the New Forest.

New Forest Grasslands

3.8.11 Within the habitat matrix of the Crown Lands are a range of acid to neutral grasslands where the specific vegetation types are strongly influenced by the local geology and continuous grazing. The naturally infertile soils support herb-rich vegetation communities on the drier brown earths.

3.8.12 More productive wet acid grasslands are found on gleys and peats which are flushed or on areas flooded by streams in winter known as 'lawns'. These are species-rich with many sedges and wetland herbs. Other areas of productive more neutral grassland are found on village greens where congregating animals have fertilised the grasslands. The latter support a once widespread but now very rare flora characteristic of such heavily grazed village greens.

New Forest Rivers and Streams

3.8.13 The main streams draining the Forest are the Beaulieu River and Lymington River, and their numerous small tributaries. These are considered some of the most natural watercourses in southern England and contain naturally nutrient poor water, abundant pool and riffle features, meanders, and other aspects of natural watercourse development.

3.8.14 Parts of the middle and lower reaches of many Forest streams, however, were straightened or bypassed, especially during the 19th century. The Forest streams also have naturally variable flow rates, often with very low flows during the summer months and spate flows following heavy rainfall in the catchment. Blackthorn, willow, and hawthorn scrub are an important riparian habitat, but its ecology is complex and has been much altered by drainage through the Forest lawns and the deposition of dredging spoil along drains and watercourses. These rivers and wetlands are home to the rare and declining native crayfish, the water vole and occasionally otters, all species for which the Agency is the National Contact under the UK's Biodiversity Action Plan commitments.

3.8.15 In addition to rivers and their catchments, the New Forest contains a number of standing water bodies. The management of these is of critical importance to the conservation of the New Forest's wetlands.

Permanent and Ephemeral Water Bodies of the New Forest

3.8.16 Within the New Forest lie a very large number of permanent ponds, the largest of which are sites such as Hatchet Pond and Fritham Pond, the latter being a relic of gunpowder manufacture using the impounded Latchmore Brook. Many of the Forest ponds support a rich marginal vegetation that is dependent on stock grazing, trampling and the maintenance of high, although seasonally fluctuating water levels. Many ephemeral ponds occur in damp hollows associated with watercourses, although the most interesting and specialised invertebrate faunas occur in the ephemeral ponds away from the valleys, in such places as village greens.

3.8.17 The permanent pond resource has not been fully investigated, but it is known to be an extremely rich and unusual resource for research. The hairy dragonfly (*Brachytron pratense*) and downy emerald dragonfly (*Cordulia aenea*) are associated with this habitat.

3.8.18 Ephemeral water bodies in the New Forest support internationally rare and specialist flora and fauna which depend upon a hydrological regime that allows flooding during the winter months, a gradual drying during the summer months and maintenance of high water quality. Species associated with this unusual habitat include crustaceans such as the fairy shrimp (*Chirocephalus diaphanus*) and the tadpole shrimp (*Triops cancriformis*).

3.8.19 The dung beetle (*Aphodius nigra*) is another example of a specialist invertebrate which relies on cattle dung trodden into the edge of such water bodies. In the UK this species is known only from one location in the New Forest and when further research identifies its precise habitat requirements the Agency, through its commitments to the UK Biodiversity Action Plan, will be charged with the responsibility of integrating these with any Catchment and Water Management Plans.

3.8.20 Notable plant species for this habitat type include the Hampshire purslane (*Ludwigia palustris*) and slender marsh bedstraw (*Galium debile*), both of which are almost confined to the New Forest in the UK. Pillwort (*Pilularia globulifera*) and penny royal (*Mentha pulegium*) also have strongholds in the Forest where this specialist habitat occurs. The conservation needs of both these species are identified within the UK's Biodiversity Action Plans and the Agency has specific responsibilities towards the conservation of pillwort.

Debris Dams of the New Forest

3.8.21 Woody debris accumulates in many reaches of New Forest rivers, collecting as debris dams of various sizes and configurations. These dams, consisting of tree trunks and large branches which catch and hold smaller branches, can have significant effects on the natural dynamic channel processes such as sediment transport and on the travel times of flood peaks. Their presence also leads to significant changes and diversity in channel morphology, resulting in the development of additional deep pools below and shallows above, new meanders, and some out of bank flooding which sustains the important riparian wet woodlands.

3.8.22 The nature conservation value of debris dams is high, supporting a characteristic fauna including large numbers of invertebrate species more typical of marginal habitats. There is also some suggestion that a group of specialist invertebrates may inhabit the submerged and decaying wood in the dams, with a further group known to inhabit the silt and sand bottomed bed that develops in the pools upstream of the debris dam.

Statutory Nature Conservation Designations of the New Forest

3.8.23 The nature conservation value of the New Forest Crown Lands is afforded statutory protection in both a national and international context, having been designated under several national Acts and European habitats legislation:

- *1971 Convention on Wetlands of International Importance*
  (The Ramsar Convention)
  The New Forest is designated a Ramsar site by virtue of its valley mires and adjacent wet heaths and the nationally rare plant and animal species that it supports.

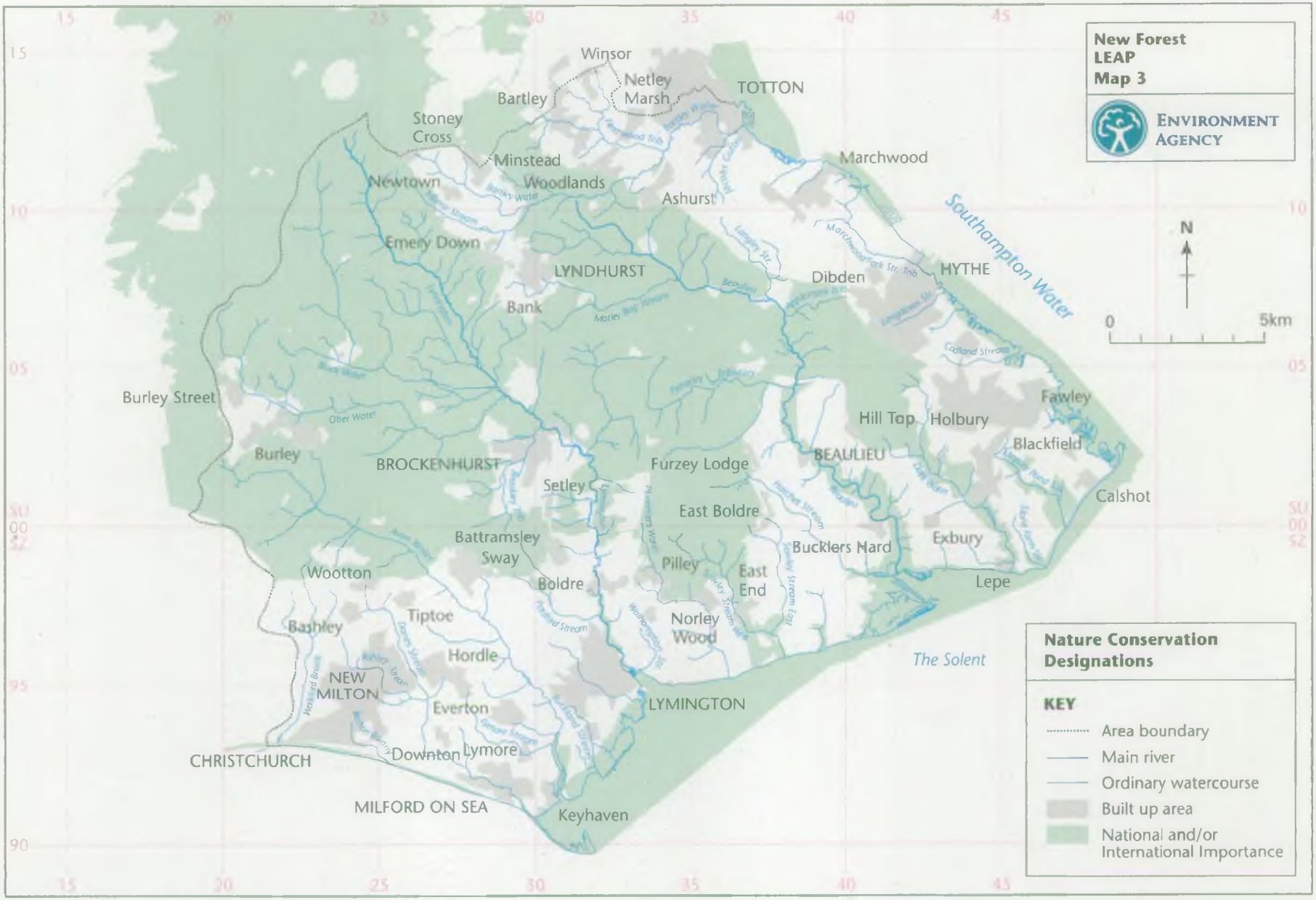
- *1979 EC Birds Directive*
  The New Forest is designated a Special Protection Area (SPA) for supporting internationally important populations of breeding and wintering bird populations. The bird species to which the Directive is relevant depend on the heathland habitat of the New Forest.

- *1984 Wildlife & Countryside Act*
  The New Forest is designated a Site of Special Scientific Interest (SSSI).
  Although the Forest has not been formally declared a National Nature Reserve, it has the status of an NNR through a Letter of Intent between the Forestry Commission (Forest Enterprise) and English Nature.

- *1992 EC Habitats Directive*
  The New Forest has been put forward to the EC as a candidate Special Area of Conservation (cSAC) for supporting both habitats and species of European Interest, and habitats of European Priority Interest. Listed species and habitats whose existence are not disputed include:-
  - Alder woodland on flood plains (priority interest),
  - Nutrient-poor, shallow waters with amphibious vegetation,
  - Wet heathland with Cross-leaved Heath,
  - Depressions on peat substrates, and;
  - Southern Damselfly *Coenagrion mercuriale*.

One listed habitat (Mediterranean temporary pools, priority interest) is disputed since its occurrence is not accepted by New Forest ecology experts.

These designations are shown on Map 3.


New Forest
LEAP
Map 3
Environment Agency
N
0
5km
Winsor
Netley Marsh
TOTTON
Bartley
Stoney Cross
Minstead
Newtown
Woodlands
Ashurst
Marchwood
Southampton Water
Emery Down
LYNDHURST
Dibden
HYTHE
Bank
Burley Street
Burley
BROCKENHURST
Furzey Lodge
Setley
Hill Top
Holbury
Fawley
Blackfield
BEAULIEU
Calshot
East Boldre
Battramsley
Sway
Wootton
Boldre
Pilley
East End
Bucklers Hard
Exbury
Lepe
Bashley
Tiptoe
Hordle
Norley Wood
NEW MILTON
Everton
LYMINGTON
The Solent
CHRISTCHURCH
Downton
Lymore
MILFORD ON SEA
Keyhaven
Nature Conservation Designations
KEY
Area boundary
Main river
Ordinary watercourse
Built up area
National and/or International Importance

The New Forest area also has examples of the following habitats which are listed in the Habitats Directive but are not features for swhich the SAC was designated:-

- Calcium-rich spring water-fed fens,
- Rivers with floating vegetation often dominated by water crowfoot,
- Annual vegetation on exposed banks (*Nanocyperetalia*) (no lay name),
- Purple moorgrass meadows, and
- Transition mires and quaking bogs.

Two habitats are of such rarity at a European level that they were omitted from the Habitats Directive, presumably in error:-

- Valley bog vegetation (*Erico-Sphagnion*), and
- Temperate nutrient-rich ephemeral ponds.

The woodland habitats of European interest listed for the New Forest include epiphytic floras which are very vulnerable to air pollution:-

- Alder woodland on flood plains (priority interest),
- Beech forests on acid soils, and
- Dry oak dominated woodland.

Local Nature Conservation Designations of the New Forest Fringe

3.8.24 To the periphery of the Crown land, the forest fringes include a number of Sites of Importance for Nature Conservation (SINCs) shown in the Local Plan. These local designations are not afforded statutory protection but have significant nature conservation value of county importance and are afforded planning value. The New Forest fringe includes many small unimproved meadows often on spring lines, heathlands surviving from enclosure and enclosed ancient woodlands. Many examples of the meadows and heathlands have been added to the New Forest SSSI whilst some others have been designated as SINCs.

The Farmland Belt

Introduction

3.8.25 The southern margin of the Crown lands merges through a mosaic of medieval and post-medieval enclosed farmlands around Sway and Brockenhurst, into the well drained and productive farmlands on the light soils of the coastal slopes. Much of this area is intensively farmed by private estates, and the suitability of the soils is attested by the Agricultural and Horticultural research establishment at Efford, west of Lymington.

3.8.26 The eastern margin of the LEAP area along Southampton Water lacks this intensively agricultural zone with the area of New Forest fringe small farms mainly passing directly in to the coastal zone.

Natural Resources of the Farmland Zone

3.8.27 The nature conservation resource is more limited in this zone, but a number of small rivers in incised stream valleys, such as the Dark Water, rise in or pass through the area. There are a number of isolated heaths and mires, meadow grasslands and ancient woodlands and particular features such as the medieval Sowley Pond, created for iron working.

Designations

3.8.28 Sites designated for their scientific importance are more limited in this zone, although Sowley Pond SSSI, noted for surface feeding and diving ducks, is located in this area and a number of SINCs also occur.

The Coastal Zone

The Resource

3.8.29 The coastal zone of the LEAP area includes several wooded estuaries such as the Beaulieu, but is dominated by saltmarshes and mud flats protected by the shingle spits of Hurst and Calshot, with some low cliffs of Pleistocene gravels and Eocene/Oligocene rocks, and a number of grazing marshes.

3.8.30 The soft coast of the area comprises zones which include intertidal muds, cordgrass (*Spartina anglica*) marshes and mixed saltmarsh towards the tidal limit, whilst behind the sea wall there are extensive fresh and brackish marshes.

3.8.31 These enclosed grazing marshes, especially those within the Hurst Castle & Lymington River SSSI, also include a series of freshwater to saline lagoons which support rare invertebrates and are a priority habitat under the 1992 Habitats Directive. The intertidal habitats and coastal grazings together with some arable land are also of international importance for wintering wildfowl, and are protected under the 1979 Birds Directive. The enclosed grazing marshes include large areas of upper saltmarsh (Atlantic saltmeadow), the bulk of this habitat occurring in the western Solent and harbouring a rich specialist flora with many nationally scarce species.

3.8.32 Of the several estuaries included within the coastal zone, the Beaulieu Estuary, which is part of the North Solent National Nature Reserve, comprises riverine oak woodland with flanking areas of shingle and marsh. The Lymington River, also of significant nature conservation value, supports both open saltmarsh and other intertidal habitats, and a large reedbed of national conservation importance, designated a SSSI.

3.8.33 The saltmarshes of the LEAP coast have been the subject of considerable research, particularly in relation to the ecology and taxonomy of cordgrass (*Spartina*), and conservation effort particularly to form bird reserves. In Southampton Water the marshes have been much reduced by reclamation over the last two centuries, and in the north west Solent much of the marsh has been managed or impounded over an even longer time span for saltworking, fisheries, and to drive tide mills, all or part of which still exist, at Eling, Ashlett, and Beaulieu.

3.8.34 For reasons which are not understood, the intertidal foreshore has been narrowing and steepening over the last few decades. Marine aggregate extraction, channel and sea wall management, sediment changes associated with *Spartina* marsh development, and other causes have all been cited.

Statutory Nature Conservation Designations of the Coastal Zone

3.8.35 Much of the coastal zone is designated, with several SSSIs existing within the area (Map 3); these include the Hythe to Calshot Marshes SSSI on the west of Southampton Water, the Beaulieu Estuary SSSI, and the Hurst Castle and Lymington River Estuary SSSI. The impounded estuary of the Lymington River is also designated as the Lymington River Reedbeds SSSI and the Lymington River itself has recently been notified as a riverine SSSI by English Nature. This will now need to become the subject of a Memorandum of Understanding between English Nature and the Agency, and a Consenting Protocol and River Conservation Strategy will need to be agreed. In addition to SSSI designations in the area, much of the Beaulieu and its estuary is designated as the North Solent NNR which extends along the shore from Beaulieu to Calshot. Three Local Nature Reserves are also designated in the coastal zone: Lymington and Keyhaven Marshes, Calshot Marshes and Boldre Foreshore.

3.8.36 In addition, two European designations exist for the marine and intertidal elements of the zone:

- *1979 Birds Directive*
  The majority of the intertidal area of the coastal zone is proposed for designation as the Solent & Southampton Water Special Protection Area (pSPA), for its importance to wintering and breeding waterfowl populations.

- *1992 Habitats Directive*
  Almost the entire length of the coast in the LEAP area is being considered for submission as a candidate Special Area of Conservation (Maritime cSAC), for the importance of the *Spartina* swards, Atlantic saltmeadows and estuaries that it supports. The lagoons of the Hurst Castle and Lymington River Estuary SSSI are designated separately and form part of the Solent & Isle of Wight Lagoons cSAC. The bulk of the Atlantic saltmeadows in the LEAP area occurs within the embanked grazing marshes and is therefore not protected by a SAC.

Local Nature Conservation Designations of the Coastal Zone

3.8.37 As well as a number of statutory nature conservation designations, the coastal zone also includes areas designated as SINCs, which are of significant nature conservation value in a county context.

3.9 Fisheries

Fish Species Present in the Rivers and Streams

3.9.1 An electric fishing survey of the five main running waters in the LEAP area, conducted by the NRA in January - February 1993, indicated the presence of 12 species of freshwater fish plus flounders (a marine/brackish water species) in the lowermost reaches (Table 2). Further fish known to be present include spined sticklebacks, bass, thick lipped mullet and thin lipped mullet (marine/brackish water species, in lowermost reaches).

3.9.2 Non-migratory brown trout and migratory sea trout occur in most of the New Forest streams and represent freely interbreeding fractions of a single population where they occur together. Females predominate in the migratory (sea trout) fraction, and males among the brown trout. Sea trout generally return accurately to the stream of their birth and the stocks in individual rivers may be considered to be genetically distinct stocks. A salmon was reported on the Beaulieu River in 1993 and old issues of the annual publication 'Where to Fish' (e.g. 1928, 1955) list salmon as being present in the 'Warburn' (an old name for the Avon Water). Salmon homing to the Rivers Test and Itchen do pass through the coastal waters covered by this LEAP and protection from illegal exploitation is a matter of some concern.

Table 2 - Fish Species Recorded in Electric Fishing Surveys, January - February 1993

FISH SPECIES	BARTLEY WATER	DARK WATER	BEAULIEU	LYMING-TON	AVON WATER
Trout Brown / Sea	✓	✓	✓	✓	✓
Eel	✓	✓	✓	✓	✓
Pike				✓	
Perch			✓	✓	✓
Brook Lamprey	✓	✓	✓	✓	✓
Stone Loach	✓	✓	✓	✓	✓
Bullhead	✓	✓		✓	✓
Roach	✓			✓	✓
Dace	✓			✓	✓
Chub				✓	
Rudd					✓
Minnow	✓	✓	✓	✓	✓
Flounder		✓	✓	✓	

3.9.3 The juvenile salmonid stocks within the LEAP area were fairly low compared to first-class nursery streams in, for example Wales and South West England. It is likely that the streams in this area are different in carrying capacity to those in the other areas, by virtue of the characteristic channel topography, hydrology, water chemistry and biological productivity.

3.9.4 Eels spawn in the Sargasso Sea of the western Atlantic and their young drift on the Gulf Stream to British shores from which they ascend virtually every running water in the land. After several years feeding and growing in fresh water they return to the sea for their spawning migration from which they do not return. The eels in different streams are therefore genetically part of an overall North Atlantic population and do not represent different stocks or sub-stocks. Flounders, bass and mullet are marine species that on occasions enter the lowermost reaches of rivers. They are considered no further here.

3.9.5 The origin and history of the other freshwater species occurring in the streams of the LEAP area is uncertain, but some are likely to have been resident since the streams were tributaries of the Solent River which joined the Rhine when Britain was still joined to Europe by a land bridge, about 10,000 years ago. Others are likely to have arisen from introduction by humans. It is believed that stream fish communities within the LEAP area have been subject to very little stocking with genetic material from other streams. Such pristine river fish communities are rare in the UK.

Fish in Still Waters

3.9.6 Although there are over 300 ponds within the New Forest, the majority are man-made. Most were created as reservoirs for water mills or other industrial purposes, as ornamental landscape features, or are flooded pits from which gravel was extracted.

3.9.7 Most are small in area; only one (Sowley Pond) exceeds 10ha, with perhaps a further 30 of over 1ha. Many have been stocked with fish, either brown and rainbow trout (e.g. Sowley Pond, Leominstead Lake, Hordle Lakes, Turcroft Farm Lakes) or coarse fish (e.g. Hatchet Pond, Mopley Pond, Roundhill Pond, Orchard Lakes and Sway Lakes). The Forestry Commission list pike, roach, bream, tench, carp, rudd and eels as being present in Hatchet Pond.

Fish and Shellfish in the Sea

3.9.8 Marine fish are not included in the remit of the Agency but within the LEAP area, there are three areas of relevance:-

a) Sea trout returning to streams within the LEAP area and salmon returning to rivers nearby but outside the LEAP area may be exploited by net fisheries both legally and illegally.

b) Eels residing in coastal and non-tidal waters are exploited by net fisheries in tidal and coastal waters.

c) There are extensive fisheries for laid and natural stocks of molluscs and shellfish in the estuaries and coastal water of the LEAP area. While their management lies outside the scope of this LEAP, they are affected by coastal water quality.

3.10 Landscape

3.10.1 The Agency has a duty to contribute to the conservation of natural beauty, geology and landscape features of special interest through the work of its various functions.

Topography

3.10.2 Topographically the LEAP catchment can be subdivided into four broad zones:-

a) The North-West, which is relatively high in elevation (over 120m in places) and has plateaux dissected by parallel 'U' shaped valleys with sides affected by slumping. Vegetation is mainly heather and grass heath with mires and streamside lawns in valley bottoms.

b) The Central belt, which comprises wide valleys and gentle rolling hills. This is the zone within which the main woodland areas of the catchment occur, including the Timber Inclosures and the Ancient and Ornamental Woodlands.

c) The Southern belt, which is characterised by flat plains and wide shallow valleys. Vegetation is mainly heather on the plains with acid grassland and extensive mire vegetation in the valleys.

d) The Coastal zone, which comprises a series of estuaries with extensive intertidal sand and mudflats, saltmarshes, reedbeds and freshwater to saline lagoons.

Close association can be seen between topography, geology, soils and vegetation across the catchment and the enclosed and settled land is closely linked with the distribution of better quality soils.

3.10.3 All of the streams and rivers draining this catchment cross the first three topographical zones outlined above and their character changes as they do so. The north-west valleys are 'U' shaped and show evidence of seepage on their sides, whilst the southward and eastward progression brings with it a slowing of flow rates and a reduction in the eroding effects of the watercourses as the land becomes lower lying.

Heritage Factors

3.10.4 The wider New Forest has an unusually well documented history and the current landscape contains many elements of earlier activities. Many of the area's characteristics derive from the pattern of Bronze Age settlement and its subsequent 11th Century status as an important hunting forest, but the development of commoning of unenclosed land for pasture and fuel became gradually more dominant up to the late 16th Century. In the 17th and 18th Century significant inclosure took place in order to provide timber for locally built naval ships. This process created the pattern of inclosures which can still be seen today, but also put pressure on the commoning community such that limits on further inclosure were eventually formalised via the New Forest Act of 1877.

3.10.5 Subsequent Acts have strengthened the commoners' interests as the value of the New Forest has been increasingly appreciated and there has been a growing understanding of the importance of the continued grazing of stock to the maintenance of the area's unique landscape characteristics. Outside the Crown lands, much of the original pattern of back-up grazing land has been retained, although pressure from housing, transport, recreational and utility development has led to significant landscape change in the last 30 years.

3.11 Archaeology

3.11.1 This section considers the protection of the historic built environment associated with rivers and wetlands in this catchment. The Agency aims to ensure that these features are not degraded through neglect, mismanagement, or insensitive development and, where possible, to take measures to enhance them. The Agency has duties to conserve and enhance sites and objects of archaeological, architectural or historic interest, which are fulfilled through the work of our various functions. An important part of our work is to influence landuse planners and land managers to look after rivers and wetlands sensitively.

Inland Features

3.11.2 As a result of its unique history, the New Forest area represents an important archaeological resource. However, due to the relatively limited level of development in the area, much of this resource is unidentified in detail. The Forest itself is probably the largest coherent block of unploughed lowland in southern England. Bronze Age burial mounds and boiling mounds are scattered across the catchment and there are 35 - 40 field systems of either Bronze or Iron Age. A few hill forts from the latter period are also found in the area.

3.11.3 Evidence of human activity is limited up until the medieval period, after which time a wide range of features survive. These include the Forest boundary marks, evidence of inclosure, sites of hunting lodges and embankments. 18th and 19th Century woodland inclosures are clearly in evidence today, as are World War II features such as airfields and bunkers.

3.11.4 There are approximately 130 Scheduled Ancient Monuments (SAMs), protected by the Ancient Monuments & Archaeological Areas Act 1979, within the catchment, together with up to 20,000 entries in the Hampshire County Council Sites & Monuments Record which have no statutory protection. English Heritage have compiled a Register of Parks & Gardens of Special Historic Interest and there are five entries within the LEAP catchment:-

- Brockenhurst Park
- Cadland House
- Exbury House
- Pylewell Park
- Rhinefield

Coastal Features

3.11.5 The salt marshes along the LEAP coast contain evidence of extensive salt workings. The castles at Hurst and Calshot Spits date from Tudor times and are now managed by English Heritage. The village of Bucklers Hard represents one of the most important sites in the Solent for construction of Navy vessels in the 18th Century. Tide Mills exist at Beaulieu and Eling - the latter being still fully operational.

3.11.6 There is a growing awareness of the importance of submerged archaeology such as shipwrecks and sites of ancient shoreline settlement. The Hampshire & Wight Trust for Maritime Archaeology is playing an important role in the identification and recording of such sites. National and local Government is now seeking ways in which the level of protection of land-based features can be extended to submerged archaeology.

3.11.7 Coastal and river defence works have the potential to compromise some of the features described above. In order to fulfil its obligations in respect of protection of features of archaeological significance, the Agency is liaising with Hampshire County Council and the Hampshire Field Club and Archaeology Society (New Forest Section) with a view to developing a database of all features sited in or adjacent to rivers, wetlands or the coast.

Chapter 4

Issues List

This is a summary of the environmental issues which arise from consideration of the catchment characteristics and the uses and pressures within it. Details are given in Chapter 8.

CHAPTER 4: ISSUES LIST

4.1 On the basis of an initial review of the concerns and aspirations of the various organisations with interests and responsibilities within the LEAP catchment, the Agency has identified a large number of issues which may need to be addressed within a future Action Plan for the area. These issues derive from the details presented in Chapters 6 and 7 and have been divided into those which are at this stage considered major issues for the Agency and those which are considered subsidiary.

4.2 At this stage major issues are those which either the Agency has already identified as requiring future action (as a result of ongoing implementation of statutory duties) or those which have received strong representation from initial consultation. Subsidiary issues generally comprise those which arise from emerging legislation or where there is a current lack of information upon which to base future decisions. Within each division, issues are not listed in order of relative importance. Table 3 sets out the issues. Full details of the background, effects and options for action in respect of each of the identified issues are set out in Chapter 8.

4.3 These issues were ranked by a stakeholder group, according to the methodology described in Chapter 4.4, to produce the prioritised list shown in Table 3B.

4.4 By virtue of this consultation document the Agency hopes to establish the views of the public and other external organisations regarding the relative importance of the identified issues. It is likely that new issues will be raised in the process and these will be considered by the Agency in formulating an Action Plan for the LEAP area.

4.5 This report has identified a range of issues which have evolved from our assessment of the current state of the New Forest catchment and the pressures/activities placed upon it. A number of actions have subsequently been proposed which will potentially have cost implications for both the Agency and external organisations. In order to provide value for money, these actions need to be weighed up against the benefits they will achieve.

4.6 The Agency commissioned the University of London to develop a framework and practical guidelines for the prioritisation of issues and actions in LEAPs. To do this a stakeholder group was recruited to pilot a methodology for the New Forest Area to achieve a consensus on what the priority issues for the Area are.

4.7 The stakeholder group represents an essential part of a wider consultation process. This consultation practice is based on the idea that decisions will be more robust if a measure of consensus is taken between those with a stake in what happens. It is designed to ensure that the Agency is open and accountable whilst considering the views of the local community and developing partnerships to implement the actions which are of the highest benefit and lowest cost.

Table 3A - Table of Issues : Main Issues

ISSUE NO.	ISSUE DESCRIPTION
M1	Excessive unlicensed surface water abstraction for trickle irrigation
M2	Clarification is required over the inter-relationship of powers and responsibilities between the Environment Agency and the Forestry Commission within the New Forest
M3	Loss of biodiversity and the water resource associated with damage to valley mire systems
M4	Loss of biodiversity associated with engineering works on natural river courses
M5	Loss of biodiversity associated with recreational use of watercourses
M6	Limited knowledge on the nature of the water resource due to lack of groundwater and surface water monitoring
M7	Low summer flow rates in certain New Forest streams
M8	Reduced stream water quality during summer low flow
M9	Disruption of stream ecology and processes due to the removal of debris dams from New Forest watercourses
M10	Reduced recreational water quality at Calshot
M11	Derogation of the Keyhaven Pond at the Lymington and Keyhaven Nature Reserve
M12	Continuing prohibition of shellfish production in the vicinity of the current Pennington WWTW outfall
M13	Improved management of urban and agricultural surface water run-off
M14	Development of the Flood Defence Management System (FDMS)
M15	The impact of sea level rise on intertidal areas (coastal squeeze)
M16	Inadequate understanding of the effect of acid deposition on ecology of the New Forest
M17	Inadequate understanding of the impact of sulphur dioxide emissions
M18	Inadequate understanding of the combined impacts of process emissions
M19	Public concern over odour control at industrial sites
M20	Status of sea trout population is unknown
M21	Obstructions to free passage of sea trout
M22	Poaching pressure on sea trout stocks

Table of Issues : Subsidiary Issues

ISSUE NO.	ISSUE DESCRIPTION
S1	Implications of the Habitats Directive on the Agency
S2	Fulfilling the Agency's biodiversity commitment
S3	Loss of biodiversity associated with deepening of ephemeral water bodies
S4	The threat to aquatic ecology of New Forest watercourses caused by the spread of alien flora and fauna
S5	Reduced nature conservation value of Lymington Reed Beds SSSI
S6	Groundwater contamination at Ampress Works public water supply
S7	The control and maintenance of privately owned flood defence structures
S8	Defining the role of the Agency in local air quality management
S9	Inadequate understanding of the effect on public health of PM_{10} arising from waste handling facilities
S10	Lack of knowledge of fish stocks in still waters
S11	Lack of free public fishing in the New Forest

4.8 The Stakeholders

The membership of the LEAP stakeholder group was based on a number of criteria to ensure they best represented the local community. These included:

- must live/or work within the LEAP area
- must command authority within their own organisation
- are able to represent their constituency
- possess excellent local knowledge
- are skilled in assimilation and assessment of technical information
- can work to a tight timetable
- are available for the full duration of the project

Representatives from the following sectors were subsequently selected.

- Public Sector

  New Forest District Council (Officer)
  New Forest District Council (Member)
  English Nature
  Environment Agency

- Voluntary Sector

  RSPB (also representing Hampshire Wildlife trust)
  Hampshire CPRE and New Forest Association
  New Forest Friends of the Earth
  Brockenhurst Manor Fly Fishing Club (freshwater fishing)
  Calshot Sailing Club and Southampton Water Sailing Association

- Private Sector

  National Farmers Union / Country Landowners Association
  Commoners Defence Association
  Exxon Chemical
  Southern Water
  Associated British Ports

The stakeholder group undertook a review of all the issues identified through the LEAP process using the recognised method of multi-criteria analysis. This process involved identifying a range of criteria (as shown below), which were weighted according to the stakeholders perceptions, for evaluating the issues. These criteria include socio-economic aspects as well as environmental considerations.

CRITERION	UNDERLYING VALUE JUDGMENT
To what extent is resolution of this issue a legal requirement?	Legal obligations must be met.
To what extent would tackling this issue benefit non-human species and habitats?	Biodiversity should be protected and the Environment agency must contribute to the UK Biodiversity Action Plan in line with government policy.
To what extent would tackling this issue maintain the unique status/international importance of the New Forest?	The Environments Agency's actions should not affect the 'New Forestness' of the area.
To what extent is the problem identified likely to get worse?	Issues which are likely to get worse should be tackled sooner rather than later: in particular high priority should be given to issues where delay would lead to irreversible decline.
To what extent would tackling this issue require the Environment agency to work in partnership with other Agencies?	The Environment agency should work in partnership with other organisations within a cross-organisation strategic approach.
To what extent would tackling the issue benefit public health?	Public health should be safeguarded; danger to human life is unacceptable.
To what extent is the issue well understood scientifically?	Priority should be given to tackling issues which are well understood.
To what extent would tackling this issue benefit the quality of life for residents in the LEAP area?	Improving amenity, reducing risk and redressing nuisance should be given high priority.
To what extent would tackling this issue benefit the local community?	Maintaining /creating employment should be given high priority.
To what extent are actions relating to this issue likely to be affected by potential future legislation?	Future legislation will have to be complied with.

4.9 The Final Prioritised List of Issues Based on the Multi-Criteria Analysis

The criteria were applied to each issue to produce a score by which the issues could be subsequently ranked. More information concerning this technique for prioritising issues can be obtained from the Environment Agency (Technical Report No. W114).

Table 3B - Issues in descending order of priority

ISSUE NO.	ISSUE DESCRIPTION	RANK
S4	The threat to aquatic ecology of New Forest watercourses caused by the spread of alien flora and fauna	1
M7	Low summer flow rates in certain New Forest streams	=2
M8	Reduced stream water quality during summer low flow	=2
X	Impact of the mineral extraction and land filling activities at Manor Farm	4
M3	Loss of biodiversity and the water resource associated with damage to valley mire systems	5
M10	Reduced recreational water quality at Calshot	6
M22	Poaching pressure on sea trout stocks	7
M11	Derogation of the Keyhaven Pond at the Lymington and Keyhaven Nature Reserve	8
M15	The impact of sea level rise on intertidal areas (coastal squeeze)	9
S3	Loss of biodiversity associated with deepening of ephemeral water bodies	=10
M2	Clarification is required over the inter-relationship of powers and responsibilities between the Environment Agency and the Forestry Commission within the New Forest	=10
M4	Loss of biodiversity associated with engineering works on natural river courses	=12
M20	Status of sea trout population is unknown	=12
S1	Implications of the Habitats Directive on the Agency	14
M21	Obstructions to free passage of sea trout	15
M9	Disruption of stream ecology and processes due to the removal of debris dams from New Forest watercourses	16
M5	Loss of biodiversity associated with the recreational use of watercourses	17
M14	Development of the Flood Defence Management System (FDMS)	18
M13	Improved management of urban and agricultural surface water run-off	=19
S5	Reduced nature conservation value of Lymington Reed Beds SSSI	=19
S7	The control and maintenance of privately owned flood defence structures	21
S2	Fulfilling the Agency's biodiversity commitment	22
M1	Excessive unlicensed surface water abstraction for trickle irrigation	23
S6	Ground water contamination at Ampress Works public water supply	24

M6	Limited knowledge on the nature of the water resource due to lack of groundwater and surface water monitoring	25
S9	Inadequate understanding of the effect on public health of PM_{10} arisings from waste handling facilities	26
M16	Inadequate understanding of the effect of acid deposition on ecology of the New Forest	27
M17	Inadequate understanding of the impact of sulphur dioxide emissions	
M19	Public concern over odour control at industrial sites	28
S8	Defining the role of the Agency in local air quality management	29
S10	Lack of knowledge of fish stocks in still waters	30
M18	Inadequate understanding of the combined impacts of process emissions	31
S11	Lack of free public fishing in the New Forest	32

X - Manor Farm was a new issue raised by the stakeholder group which is also addressed in issue M11 (see Chapter 8.3).

This ranked list of issues represents the priorities of the stakeholder group, advising the Agency as to where we should concentrate our activities over the next 5 years and to help us further develop an Action Plan:

- Have all major environmental issues been identified?
- Do you agree with the ranking of the issues?
- Which issues do you support or oppose?
- In what way can you or your organisation work in partnership with the Agency to improve our local environment?

Chapter 5

Protection Through Partnership

This chapter explores some of the areas for actual and potential partnership ventures.

CHAPTER 5: PROTECTION THROUGH PARTNERSHIP

5.1 The Agency works in partnership with many organisations and individuals concerned with the protection and enhancement of the environment. In the UK as a whole much has been achieved already but much more is possible by working closely with others. The Agency is essentially a regulatory body and does not give grants. Therefore, to achieve some of its aims it must co-operate with others such as local authorities and MAFF to harness their financial resources and technical expertise. The Agency can also work towards its objectives by collaborating with voluntary groups, such as the Hampshire Wildlife Trust, and recreational associations. In some cases partnerships are already well established with other statutory bodies, especially where there is joint responsibility.

5.2 This chapter outlines some of these partnerships and indicates opportunities for further development.

Links with Local Authorities

Development

5.3 We are a statutory consultee and advise local planning authorities on the impact of proposed development, together with our requirements for environmental protection (see Section 6.1 Urban Development and Land Use Planning). We also work with the local planning authority to ensure that suitable policies to protect and enhance the environment are incorporated within Development Plans and County Structure Plans.

Memorandum of Understanding

5.4 In addition to land use planning the Agency meets regularly with local authorities on a large number of activities. In order to ensure a co-ordinated approach and promote better integration of our work a 'Memorandum of Understanding' (MoU) has been signed between the Agency and the Local Authority Associations. The MoU outlines the general intentions of both the Agency and Local Authority Associations to build a **relationship** based on co-operation, openness and the exchange of information. The aim is to further our shared commitment to the protection and enhancement of the environment and to ensure that the best use is made of limited resources. A number of topic-based protocols are being drawn up outlining areas of specific and shared responsibilities and forming a framework within which local agreements can be progressed.

Air Quality

5.5 The Agency and local authorities are both responsible for aspects of air quality monitoring and management, although local authorities are responsible for producing and implementing Local Air Quality Management Plans. The Agency intends to support the local authorities as discussed in Issue No. S8 in Chapter 8. The Agency is actively participating in the Air Quality Forum for Hampshire, one of the chief concerns of which is the effect of industrial activities in the Waterside. The Agency is also a member of the New Forest (Waterside) Environmental Protection Liaison Committee, together with representatives from HCC, NFDC, Parish Councils and local industry. The purpose of this Committee is to provide a basis for consultation and information in respect of aerial and related pollution issues.

Amenity and Recreation Initiatives

5.6 Local authorities often own the riverside land in towns and we work with them on schemes to enhance the town centre river corridor with, for example, landscaping, walkways and riverside seating. As part of such schemes nature conservation can be furthered by incorporating areas suitable for wildlife habitat.

Litter

5.7 The Agency has no powers or resources to clear litter in and around rivers and so there is a need to work with local authorities and other groups on reduction and clearance schemes.

Biodiversity

5.8 The Agency is working in partnership with local authorities, Hampshire County Council, Country Landowners Association, National Farmers Union, Hampshire Wildlife Trust and many others to maintain and enhance the rich and varied natural resource in the New Forest LEAP area through the Hampshire Biodiversity Action Plan Partnership.

Local Agenda 21

5.9 Across the catchment, all local authorities are assisting their local communities in developing local strategies and action plans for sustainable development. The approach adopted varies from district to district, with many Local Agenda 21 groups setting up working groups looking at specific issues. The Agency is currently looking at how it can be most effective in assisting local authorities in developing their Local Agenda 21 plans.

Shoreline Management Plans (SMPs)

5.10 SMPs are being produced by a range of groups with statutory interests working together. They provide a forum for an integrated review of coastal processes and develop sustainable coastal defence policies to set objectives for the future management of the shoreline. The SMP that includes the coast within this LEAP is called the Western Solent & Southampton Water SMP and this is discussed in Chapter 6.

Links with Government Bodies

Conservation

5.11 Traditionally, conservation matters within the New Forest have been developed through dialogue between the Forestry Commission, English Nature and the Verderers (representing commoning interests). Under the provisions of the Habitats Directive the Agency as a 'Competent Authority' will in future be seeking to participate more fully in the dialogue over the future of the New Forest. To this end the Agency has become an observer on the New Forest Committee - a grouping of the principal Central and Local Government organisations with powers and responsibilities within the New Forest Heritage Area. In addition, the Agency has also joined the New Forest Consultative Panel, a non-statutory body established to provide an open forum between the Forestry Commission and over 80 organisations representing the users of the New Forest. The Agency is also a partner in the New Forest LIFE project, a collaboration of the Forestry Commission, Hampshire County Council, New Forest Committee, English Nature and Hampshire Wildlife Trust intended to produce and implement a management plan for the entire New Forest SAC.

Agriculture

5.12 Working with MAFF is a good way of promoting the most sustainable and efficient ways of using water in agriculture. This partnership has led to documents being published and meetings held to inform the agricultural community of the need for water conservation and the best ways of achieving it.

Education

5.13 We recognise that broad-based education covering the community, educational and industrial sectors will result in a more informed society that is better able to understand the environment, its needs, and the impact of society's activities upon it. In particular, there is a need to:-

- Educate young people to equip them to make informed judgements about future environmental decisions.
- Educate industry through consultation, collaborative activities and targeted campaigns to promote a culture of prevention rather than cure.
- Raise public awareness of environmental issues to engender in society a common ownership of the environment and its challenges.

5.14 Currently, we provide a wide range of information to all sectors of society, and in addition give many talks and presentations. The LEAP is a practical example of the material we publish which can assist in raising public awareness and understanding of environmental issues.

Links with Water Users

5.15 The Agency works with both Southern Water Services and the Bournemouth and West Hampshire Water Company to manage water resources and to ensure appropriate

planning measures are made. The water companies are encouraged to reduce demand by improved leakage control, whilst consumers are encouraged to adopt a range of reduction techniques for water requirements.

One-Off Partnerships

5.16 Following a review by HCC in 1991 of all planning policies affecting the Hampshire coastline, a recommendation was made for the setting up of a broadly based co-ordinating body. The 'Solent Forum' was convened in 1992 and now comprises all of the coastal local authorities, the relevant harbour authorities and 30 other organisations including the Environment Agency. A Strategic Guidance published in November 1997, set out an approach to strategic planning and management in the Solent and provides the basis for future consultation. As a result of its statutory functions the Agency is likely to play a key part in the implementation of many of the key recommendations of this Guidance.

Chapter 6

Human Uses, Activities and Pressures on the Catchment

Society places evermore demands on the environment but expects it to be protected from harm. This chapter looks at the main uses and activities in the area and the pressures that are put on the environment.

CHAPTER 6: HUMAN USES, ACTIVITIES AND PRESSURES IN OUR ENVIRONMENT

6.1 Urban Development / Land Use Planning

6.1.1 This section covers the built environment and the process of planning and regulating the construction of new development including roads, housing and industry/business.

6.1.2 County, District, Borough and Unitary planning authorities plan and control development. Although the Agency is a statutory consultee, the planning authorities do not have to follow any advice that is provided. However, the Agency's own legislative powers can sometimes override planning permissions.

Land Use Planning

6.1.3 The Environment Agency is taking a proactive approach towards its involvement in the Town Planning system, using the opportunities to effectively influence development proposals to further the aims and objectives of the Agency. The Environment Agency will be producing a Strategy for Development Planning which will outline the aims and objectives and set out a framework for the way it will progress over the next few years. The levels of involvement are:-

National - Liaison with DETR and other national organisations, provision of consultation responses on new or revised legislation, Planning Policy Guidance and Circulars.

Regional - Liaison with Regional Government offices, provision of information and responses to Regional Planning Guidance.

Forward Planning - Making a positive input to the drafting of development plans - Structure Plans, Unitary Development Plans, Local Plans, Mineral Local Plans and Waste Local Plans - to ensure that Policies reflecting the Agency's interests are incorporated appropriately and that site designations will not be detrimental to the environment or compromise our position at a later date.

Development Control - Responding to consultations on development proposals both as pre-application enquiries and planning applications to ensure that a comprehensive response is given reflecting the interests of the Agency, minimising detrimental development and gaining environmental enhancement.

Administrative Areas

6.1.4 The majority of the LEAP area falls within the administrative boundary of the New Forest District Council and Hampshire County Council. A small part of the area comes within the administration boundary of Christchurch Borough Council and Dorset County Council. However, this part is so small (approximately ¾km wide by 2km) and is an existing residential area with all areas that are not built on being protected by

Green Belt policy, that there are no development pressures of significance to this section and it is therefore excluded from the commentary.

6.1.5 The administrative area of the New Forest District Council is larger than the area of the catchment.

Regional Planning

6.1.6 The Regional Planning Guidance for the South East was published in March 1994 and covers the period 1991 - 2011. This guidance sets as one of its main objectives the need to achieve sustainable development and environmental improvement. The guidance sets out Government policy for the region's development and provides a framework for the County Council's review of the Structure Plan.

6.1.7 The Agency has been assisting SERPLAN with its Regional Strategy Review. When complete the Regional Strategy will have a strong influence on any revision to the Regional Planning Guidance.

Structure Plan

6.1.8 The Hampshire County Structure Plan was approved in 1993 and covers the period up to the year 2001. It sets out the County Council's strategic land use and transportation policies and provides a broad framework of policies which are then refined and interpreted in Local Plans.

6.1.9 The majority of the catchment area is covered by policies which have objectives of preventing built development by seeking to protect the New Forest Heritage Area, the South West Hampshire Green Belt, Strategic Gaps between substantial settlements, and the undeveloped coast.

6.1.10 In 1996 Hampshire County Council placed on deposit its Structure Plan (Review) which takes the plan period to 2011. The plan underwent Examination in Public (EIP) towards the end of 1996 to consider representations on the deposited plan. The EIP panel recommended that the plan followed the Regional Planning Guidance and provide for an additional 12,000 dwellings to make a total of 94,750 new dwellings for the period 1996 - 2011. 7,250 new dwellings have been identified for the New Forest District Council area.

Local Plans

6.1.11 The existing statutory Local Plans and those currently in preparation are shown in Table 4, along with the housing and employment land provisions up to 2001. The Structure Plan review is proposing provision of an additional 1,675 dwellings for the period 2001 to 2011.

Table 4 - Local Plans in the Catchment

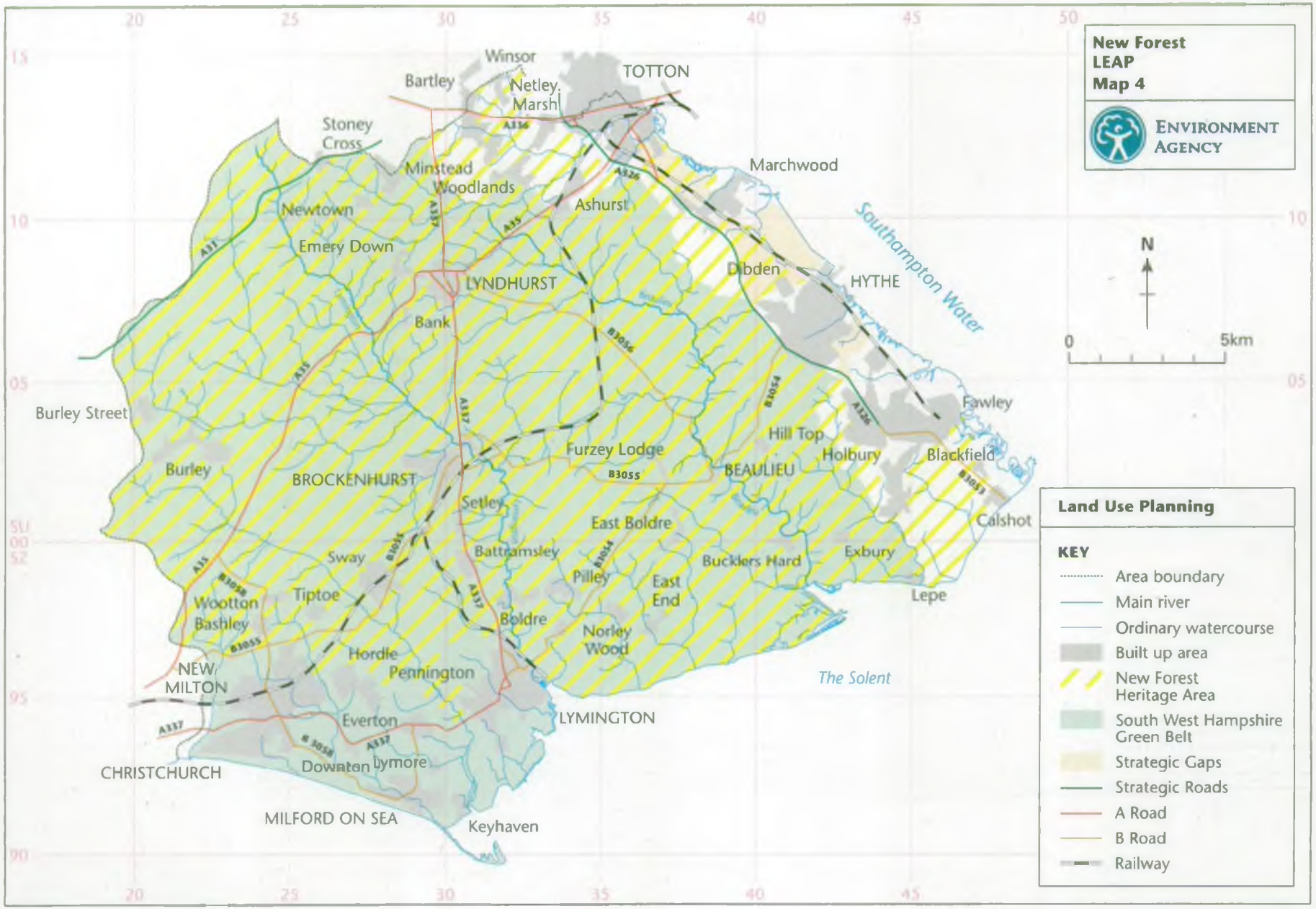
LOCAL AUTHORITY	HOUSING PROVISION 1995 TO 2001 (DWELLINGS)	EMPLOYMENT LAND PROVISION 1995 TO 2001	LOCAL PLANS PLAN STATUS
New Forest District Council	2,980 dwellings identified in sites in the Local Plan and a further 1,100 dwellings to unidentified sites (NB this includes some development outside of the catchment). The majority of this development will occur within the existing built-up areas.	105ha within the existing built-up areas. The largest sites are in Marchwood, Totton and New Milton.	Forest and Downland Villages Local Plan, adopted 1986. Coastal Towns Local Plan, adopted 1990. New Forest Local Plan, Deposit 1995
Christchurch Borough Council	No significant development in this part of the catchment.	No significant development in this part of the catchment.	Highcliffe and District Local Plan, adopted 1989. Borough of Christchurch Local Plan, Deposit 1997

6.1.12 The New Forest Local Plan defines the boundaries of the development constraint policy areas in the Structure Plan such as New Forest, Green Belt and Strategic Gaps. Policies encouraging new development generally restrict this to the existing built-up areas outside of the New Forest Heritage Area (see Map 4). The largest sites for industrial and business development are in Marchwood, Totton, New Milton and Lymington. The settlements where sites for over 100 dwellings have been identified are Hordle and Everton, Hythe and Dibden, Lymington and Pennington, Marchwood, New Milton and Totton.

Infrastructure

6.1.13 The London Waterloo - Southampton - Poole - Weymouth railway line runs through the catchment. Two roads of more than local importance pass through the catchment; the A31 (a trunk road) and the A326.

6.1.14 The County Council's proposals for the strategic road network are set out in the Structure Plan and the TPP. The catchment falls into parts of two of the County Council's Strategy Areas of Southampton and New Forest, where the emphasis is upon integrating different modes of transport within each area. The strategy for the New Forest is based upon managing the existing resources.


New Forest
LEAP
Map 4
Environment Agency
N
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5km
Winsor
Bartley
Netley Marsh
TOTTON
Stoney Cross
Minstead
Woodlands
Marchwood
Newtown
Ashurst
Emery Down
Southampton Water
Dibden
HYTHE
LYNDHURST
Bank
Burley Street
Fawley
Hill Top
Holbury
Blackfield
Furzey Lodge
BEAULIEU
Burley
BROCKENHURST
Setley
East Boldre
Calshot
Sway
Battramsley
Exbury
Buckler's Hard
Pilley
East End
Lepe
Tiptoe
Wootton
Bashley
Boldre
Norley Wood
Hordle
Pennington
NEW MILTON
The Solent
LYMINGTON
Everton
Downton
Lymore
CHRISTCHURCH
MILFORD ON SEA
Keyhaven
Land Use Planning
KEY
Area boundary
Main river
Ordinary watercourse
Built up area
New Forest Heritage Area
South West Hampshire Green Belt
Strategic Gaps
Strategic Roads
A Road
B Road
Railway

6.1.15 Planned improvements to the Strategic Network are shown in Table 5. The Agency is a consultee on such major infrastructure schemes.

Table 5 - Improvements to the Strategic Road Network Planned in the Catchment

SCHEME	STATUS
Improvements to A35 Redbridge causeway.	For completion by 2001. Exact nature of the scheme is yet to be confirmed. Widening to three lanes could bring this scheme into the catchment.
Improvements to A326 between Totton western bypass and Dibden to provide a dual carriageway.	For completion by 2001.
Improvements to Totton western bypass to provide a dual carriageway.	For completion by 2001. It is only the southern section of this road improvement which falls within the catchment.

6.1.16 Road schemes are also proposed by the District Council in the Local Plan as set out in Table 6.

Table 6 - Improvements to the Non-Strategic Road Network Planned in the Catchment

LOCATION	SCHEME	STATUS
Hythe	Link road between St John's Street and New Road.	Subject to funding from associated development.
Dibden	Dibden distributor road Stages 2 and 3.	Subject to funding from associated development. No alignment has yet been determined for Stage 3.
	Link road from Challenger Way to Stage 2 of Dibden distributor road.	Subject to funding from associated development.
Lymington	New roundabout on A337 to serve Ampress Works.	Subject to funding from associated development.
Marchwood	Distributor road Stage 2.	Subject to funding from associated development.
	Realignment of road into Husbands shipyard.	Subject to funding from associated development.
Totton	Link road from Ringwood Road to Salisbury Road.	Subject to funding from associated development.
	Link road from Brokenford Lane to Rumbridge Street.	Subject to funding from associated development.

6.1.17 Associated British Ports are considering the development of a deepwater port at Dibden Bay. This will require planning permission and the Agency will be a consultee if an application is submitted to the local planning authority.

Minerals and Waste Local Plan

6.1.18 Hampshire County Council is responsible for all aspects of land use planning in connection with mineral working and waste disposal. A Hampshire Minerals and Waste Local Plan Deposit version was published in 1993 and proposed modification to the Deposit Plan in May 1997. The future proposals for the catchment are shown in Table 7.

Table 7 - Summary of Minerals and Waste Local Plan Proposals

LOCATION	TYPE OF DEVELOPMENT	STATUS IN PLAN
Marchwood	Integrated waste processing plant	Preferred site
Fawley	Integrated waste processing plant	Preferred site

6.1.19 The Minerals and Waste Local Plan provides a planning policy framework for mineral working, waste disposal and other forms of minerals and waste development in Hampshire, and is subject to periodic review. Hampshire County Council's approach accords with the Government's strategy for the environment set out in the 1990 White Paper 'This Common Inheritance' and its sustainable framework for minerals and waste set out in 'Sustainable Development - The UK Strategy' (January 1994). Under the Planning Acts, the Agency is a statutory consultee on both the Minerals and Waste Local Plans and all planning applications for development involving minerals or waste.

Development Sites and Flood Risk in The Catchment

6.1.20 A brief summary of possible development sites in the catchment that are prone to flooding is given in Table 8.

Table 8 - Summary of Development Sites Within Areas at Risk from Flooding

LOCATION	TYPE OF DEVELOPMENT	NATURE OF PROBLEM
Totton	Residential/road development	Flood risk due to surge tides
Hythe	Residential/leisure/industrial and business/road development	Southampton Water flood risk due to surge tides
Lymington	Coast related development	Solent flood risk due to surge tides
Fawley	Petrochemical/power generation development	Southampton Water flood risk due to surge tides

6.1.21 The Local Plan contains a policy which would not allow development to be permitted in these areas unless the local planning authority, as advised by the Agency, is satisfied that:-

a) it will not result in additional flooding elsewhere or danger to life and property, or prejudice the maintenance of existing flood defences;

b) the developer can provide and make arrangements to maintain the necessary flood defences;

c) the flood defences required are acceptable in environmental terms; and

d) any other works required by the Agency (e.g. raising of slab levels) are acceptable in environmental terms.

6.1.22 The District Council has produced supplementary planning guidance for Hythe waterfront which provides advice on how developers might address the risk of flooding and directs developers to consult the Agency.

Development Sites and Sewage

6.1.23 There is doubt over the ability of the existing sewage disposal system to cater for the anticipated development in the southern part of Hythe. There are no current proposals for improvements to the system and a new pumping station and rising main will be needed.

6.2 Recreation

6.2.1 Many people spend their spare time enjoying rivers, inland waters and the coast. The Agency has a general discretionary duty to promote recreational use of water throughout England and Wales whilst safeguarding the environment. However, the provision of recreational facilities rarely rests with the Agency and the achievement of its objectives will generally depend on obtaining agreement with landowners and other interested parties.

Local Perspective

6.2.2 The New Forest Heritage Area is a major tourist destination. Estimates suggest that between 6 - 8 million day trips are made each year, with a further 17 million visits per year being made by local residents. Within the New Forest there are a number of sites where it is possible to enjoy the water environment; rivers, streams, still waters and the coast are all accessible for informal recreation. See Map 5. Undesirable effects of recreational use can result in loss of biodiversity due to disturbance and stream bank erosion. The Forestry Commission is preparing a framework strategy for recreation on the Crown lands of the New Forest which seeks to address more generally the erosion damage in the New Forest by dispersion and channelling of visitors away from more sensitive areas, along with a programme of restoration.

6.2.3 The catchment is crossed by a National Trail, the Solent Way, which runs from Hythe to New Milton. This footpath runs alongside Eight Acre Pond, Sowley Pond, Morses and Mardon Docks, and the Lymington River.

6.2.4 Freshwater based recreation in the catchment includes: angling as the main activity on many of the stillwaters of the New Forest, game fisheries on the lower reaches of the Avon Water and the Beaulieu and Lymington Rivers, and model-boat racing on Setley Pond.

6.2.5 The coastal waters provide a greater range of recreational opportunities. Southampton Water, the Solent and associated rivers and estuaries provide opportunities for canoeing, dinghy sailing, yachting, motor-cruising, windsurfing, scuba diving and sea angling. Sailing clubs operate from Calshot, Beaulieu, Lepe, Eling, Marchwood, Hythe, Fawley, Hurst Castle, Keyhaven, Lymington and Salterns Lake.

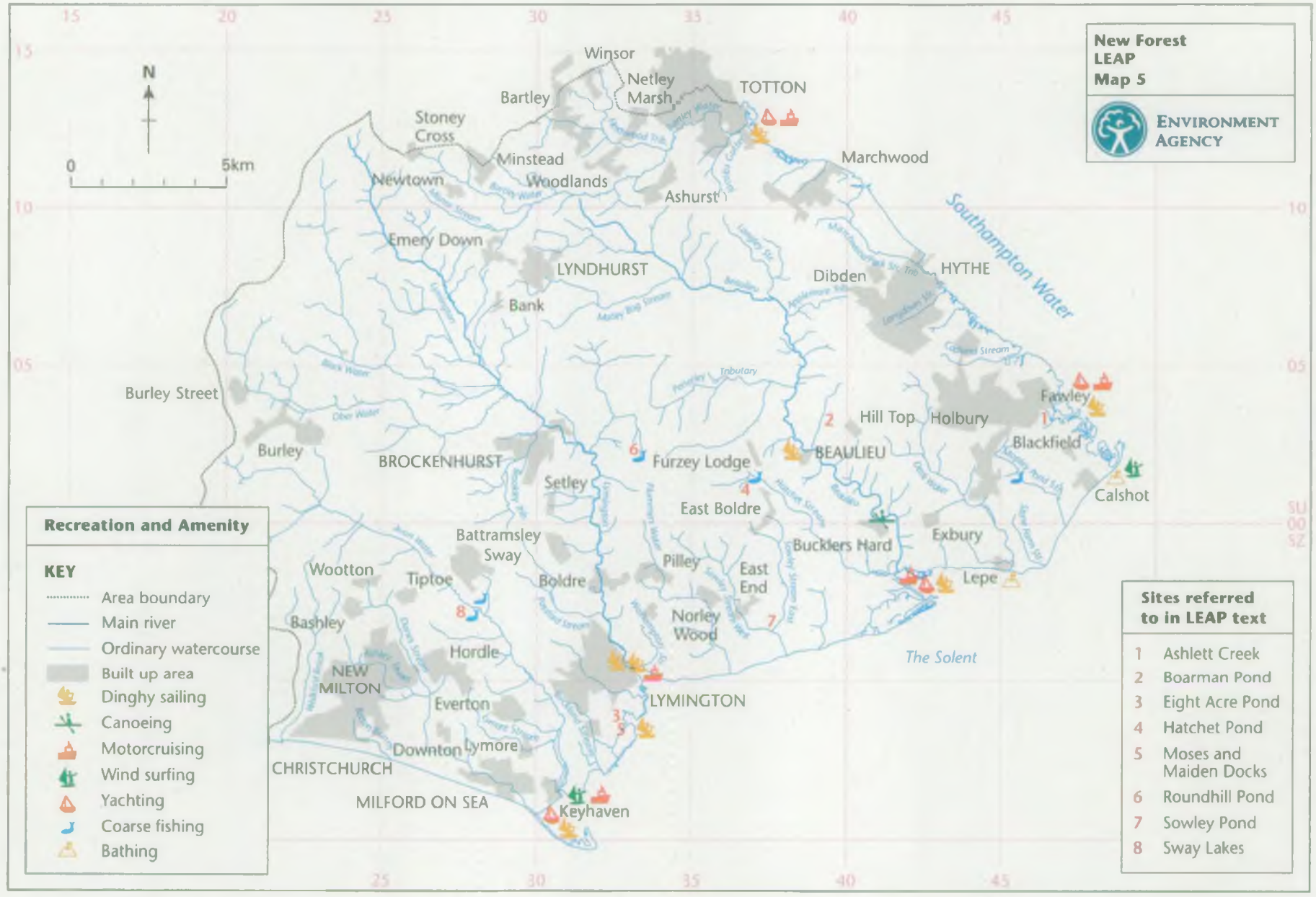
Crown Lands of the New Forest

6.2.6 Recreational pressures, derived predominantly from cycling, walking and horse-riding tend to be focused most heavily around car parks and camp sites, where people arrive having travelled into the Forest from outside of the area. If car parks and campsites are located in close proximity to habitats which are both vulnerable to erosion and attractive to visitors, the potential for significant damage to the ecology of the area is high.

6.2.7 Some of the worst affected areas where recreational pressures have led to significant ecological damage are stream sides which attract large numbers of day visitors, including Balmer Lawn near Brockenhurst, Cadmans Pool near Fritham, and Hatchet Pond near East Boldre.

6.2.8 River and stream edges through riverine woodlands attract heavy recreational pressure and can lead to significant damage to the fragile woodland or grassland ground flora associated with water courses in the New Forest, leading to the eventual erosion of the ground surface. [Issue No. M5]. This is clearly demonstrated by the example of Puttles Bridge on the Oberwater, where car park provision has led to significant erosion of the ground flora and vandalism of the stream side woodland.

6.2.9 Another threat to riverine habitats has arisen from the need to repair or replace New Forest bridges. Older bridges have traditionally allowed the transport of pedestrians, stock and riders across rivers, but as recreational pressure has grown, so the potential for conflict between these different uses has also increased. The Forestry Commission has therefore replaced a number of the wider bridges with narrow bridges, designed for pedestrians alone, with a proposal to cut back streamside banks and to create fords for animals. This may increase trampling pressures downstream, with a locally significant effect on aquatic and marginal plant and invertebrate communities.


New Forest
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Map 5
Environment Agency
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Winsor
Netley Marsh
Bartley
TOTTON
Stoney Cross
Minstead
Marchwood
Newtown
Woodlands
Ashurst
Southampton Water
Emery Down
LYNDHURST
Dibden
HYTHE
Bank
Burley Street
Fawley
Hill Top
Holbury
Blackfield
Burley
BROCKENHURST
Furzey Lodge
BEAULIEU
Calshot
Setley
East Boldre
Battramsley
Sway
Buckler's Hard
Exbury
Wootton
Tiptoe
Boldre
Pilley
East End
Lepe
Bashley
Norley Wood
The Solent
Hordle
NEW MILTON
LYMINGTON
Everton
Downton
Lymore
CHRISTCHURCH
MILFORD ON SEA
Keyhaven
Recreation and Amenity
KEY
Area boundary
Main river
Ordinary watercourse
Built up area
Dinghy sailing
Canoeing
Motorcruising
Wind surfing
Yachting
Coarse fishing
Bathing
Sites referred to in LEAP text
1 Ashlett Creek
2 Boarman Pond
3 Eight Acre Pond
4 Hatchet Pond
5 Moses and Maiden Docks
6 Roundhill Pond
7 Sowley Pond
8 Sway Lakes

Fishing

6.2.10 Angling is a very popular pastime on both the rivers and stillwaters within the LEAP area. Most of the coarse and trout fishing still waters operate as day ticket venues. The rivers Beaulieu, Lymington and Avon Water each support important and historic sea trout and trout fisheries. Fishing is not permitted on the rivers and streams within theCrown lands of the New Forest, as these areas serve as spawning and nursery areas for wild brown trout and sea trout.

Damage to Ephemeral Ponds

6.2.11 Perhaps the largest short-term threat to the specialised invertebrate fauna of the ephemeral ponds in the Forest is that of deepening of the ponds, in an attempt to create more permanent water bodies as an amenity feature. [Issue No. S3]. This has been a particular problem on village greens where the ephemeral ponds, well away from the watercourses of the valleys, are of particularly high nature conservation value, and where there may be pressures to create a permanent water feature for the village.

Coastal Zone

6.2.12 The coastal zone of the New Forest LEAP area is subject to quite different recreational pressures to the Crown lands of the Forest, with the main recreational resource of the area coming from the open sea and estuaries.

6.2.13 Whilst the pressure for more marinas along the Solent shore is currently not high, there is a high usage of the area by yachts and other leisure craft. Small craft may be a source of undesirable waste discharges which threaten the water quality of the area, with possible consequences for the marine and intertidal habitats along the shoreline which are protected under both the 1992 UK Habitats Directive and the 1979 Birds Directive.

6.2.14 The Hurst Castle to Lymington SSSI and the North Solent NNR are particularly important for supporting nationally important breeding populations of black-headed gulls and three species of tern, which may be vulnerable to disturbance through excessive recreational use of the area and high visitor pressure.

6.3 Controlled Industrial Processes and Other Emissions

6.3.1 The Agency is responsible for regulating emissions from nine operators with between them 23 Authorised Part A processes. See Table 10. One of these, the Esso plant, undoubtedly dominates sulphur dioxide emissions for the area. The Part A processes are concentrated along the eastern side of the LEAP area (Map 6). The Agency has committed itself to working closely with Local Authorities to help them assess the air quality impacts of Part A processes and to formulate action plans to ensure the National Air Quality Objectives are met by 2005, where this is necessary. Improvement plans form an important requirement of the Authorisations issued by the Agency, and those already agreed should reduce emissions significantly over the next few years (see Table 9 below). To date, however, no assessment has been carried out regarding the additive effects of the industrial emissions. [Issue No. M18].

Table 9 - Summary of Major Improvements for Part A Processes

PLANT OPERATOR	IMPROVEMENT	COMPLETION DATE	QUANTIFICATION OF REDUCTION
National Power	Reductions in particulate matter emissions	2001	From 140mg/m³ to 50mg/m³
Esso Petroleum	Installation of low NO_x burners	2000	From 5,559 tonnes/year to 3,892 tonnes/year
	Upgrade of sulphur recovery units	1999	From 8,467 tonnes/year to 6,041 tonnes/year
	Abatement of bitumen odours	1998	Reduction of odour
Enichem Elastomers	Abatement of VOC emissions	1997	From 7.18 tonnes/year to 1.5 tonnes/year
International Speciality Chemicals	Abatement of VOC emissions	1997	From 55 tonnes/year to 5 tonnes/year
	Commissioning of aerobic/anaerobic plant	1997	BOD reduction from 2,500mg/l to 500mg/l
Rechem International	Upgrade to meet conditions in hazardous waste incinerators Directive	2000	Particulate matter reduced from 30mg/m³ to 20mg/m³

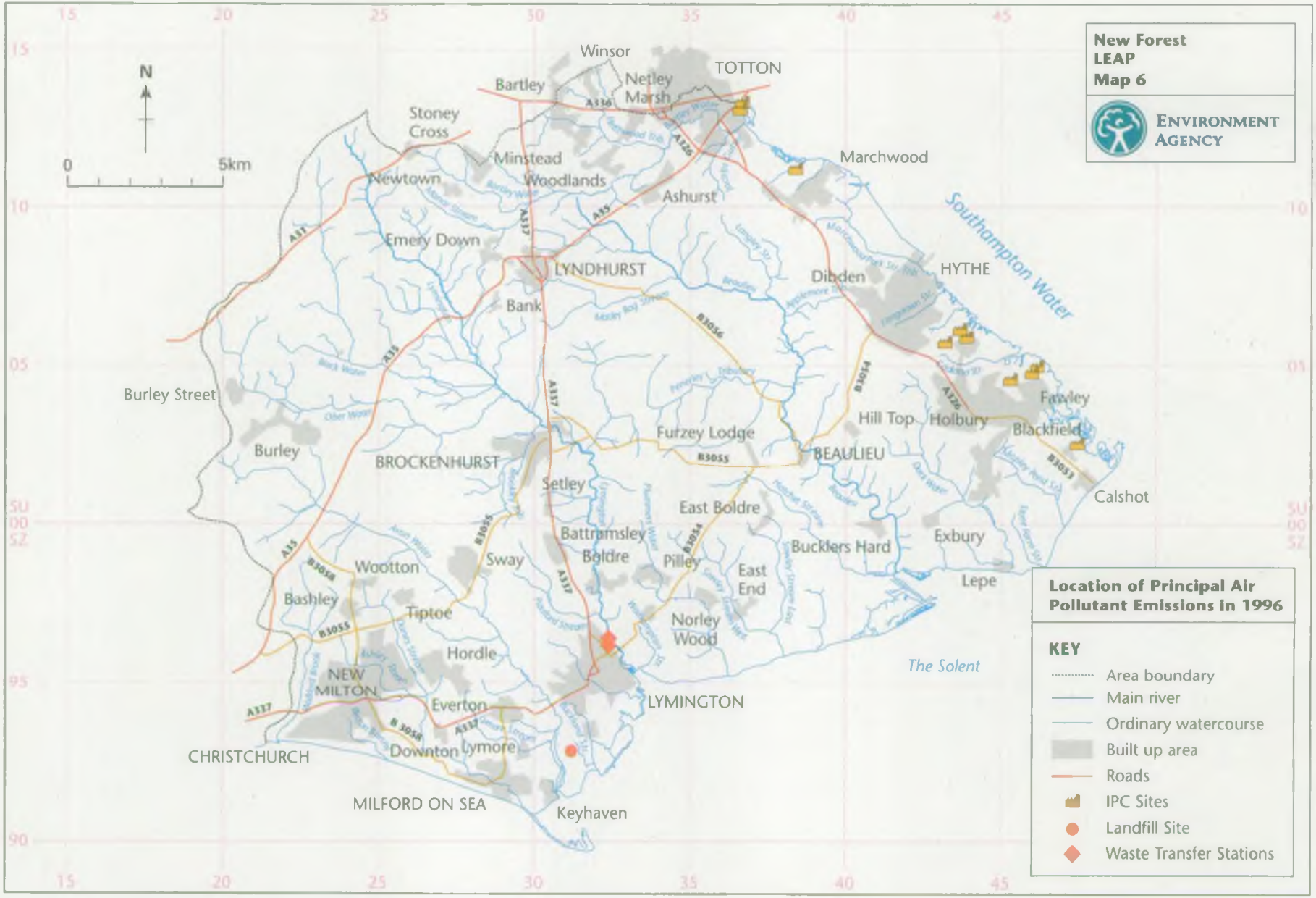
6.3.2 Emissions from road traffic are also being reduced by stringent regulations on new vehicles which, together with the steady reduction in industrial emissions which is set to continue, will improve air quality over the next decade. Air quality should therefore improve over the next decade. To date no assessment has been carried out regarding the cumulative effects of industrial emissions. [Issue No. M18].

6.3.3 There are also 27 Part B processes authorised by New Forest DC, most of which are in the LEAP area. The majority are small waste oil burners, which will not be significant sources of pollutants, and concrete batching plant, which will be a source of dust and particulate matter of less than 10µm diameter (PM_{10}). The other main emission sources affecting the area are traffic and emissions from heating plant in domestic and commercial premises (see Map 6).

6.3.4 Traffic is undoubtedly the main source of nitrogen oxides, carbon monoxide, PM_{10}, benzene, 1,3-butadiene and VOCs. Emissions from both traffic and domestic premises will be greatest in the conurbation of Southampton, lying just to the north-east of the LEAP area. In addition, there will be emissions from shipping, mainly of sulphur dioxide, as well as occasional emissions of smoke and PM_{10} from the burning of the heath land in the New Forest. These emissions are all added to the background pollutants brought into the area from other parts of the UK and elsewhere in Europe to produce the concentrations which are reported in Table 10.

Table 10 - Releases to Air from Part A Processes in 1994

	AUTHORISED PROCESSES	SO_2	NO_x	PARTICULATE MATTER	VOCs	
National SPower	1	1,837	660	-	-	The power station only operated for short periods
Esso Petroleum	2	18,565	6,441	305	4,195	
Exxon Chemicals.	4	-	160		2,916	
Nalco/Exxon Energy Chemicals	8	< 1	< 1	-	177	
Enichem Elastomers	2	1,250	220	1	54	
International Speciality Chemicals	3	40	19	-	71	
Rechem International	1	< 1	31	7	7	Other emissions were HCl, HF, HBr, heavy metals and dioxins
Bitmac	1	52	3	-	36	
Marchwood Incinerator	1	15	93	37		Other emissions were HCl, heavy metals and dioxins. Closed down in 1996
South West Tar (now Great Marsh Limited)	1	-	-	-	2	Not currently operational


New Forest
LEAP
Map 6
ENVIRONMENT AGENCY
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5km
Winsor
Bartley
Netley Marsh
TOTTON
Stoney Cross
Minstead
Woodlands
Newtown
Marchwood
Ashurst
Southampton Water
Emery Down
LYNDHURST
Dibden
HYTHE
Bank
Burley Street
Burley
BROCKENHURST
Fawley
Hill Top
Holbury
Blackfield
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BEAULIEU
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Setley
East Boldre
Battramsley
Boldre
Pilley
Buckler's Hard
Exbury
Lepe
Sway
Wootton
Bashley
Tiptoe
East End
Norley Wood
Hordle
The Solent
NEW MILTON
Everton
LYMINGTON
CHRISTCHURCH
Downton
Lymore
MILFORD ON SEA
Keyhaven
Location of Principal Air Pollutant Emissions in 1996
KEY
Area boundary
Main river
Ordinary watercourse
Built up area
Roads
IPC Sites
Landfill Site
Waste Transfer Stations

Concentrations

6.3.5 Pollutant concentrations can vary considerably from hour to hour and day to day. This is mainly due to the weather, in particular the wind. Wind speed determines how rapidly fresh emissions are diluted, while wind direction determines which sources affect the area. The influence of weather is different for sources near the ground and those emitting from tall chimneys. The former give the highest concentrations when the wind speed is low and the atmosphere is fairly stable, most frequently at night time. The latter usually give the highest concentrations with moderate winds and an unstable atmosphere in the middle of the day. For this reason pollution episodes due to emissions from chimneys do not usually coincide with, or add to, those from near-ground sources. Winds across the LEAP area are predominantly from the west and south. For the majority of the time, emissions from the industrial plant along Southampton Water will therefore be blown out of the LEAP area. A summary of pollutant concentrations in the LEAP area follows.

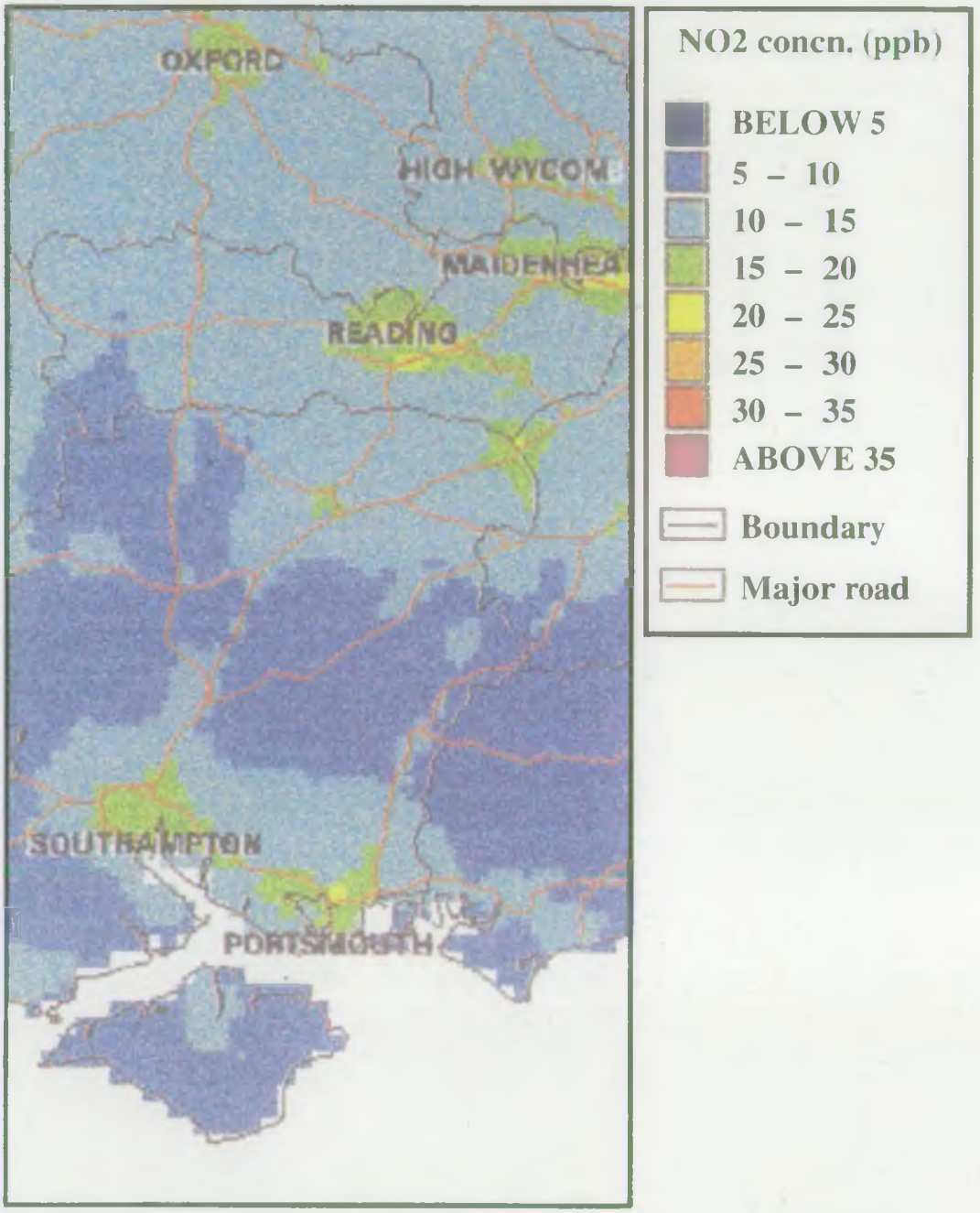
Nitrogen Dioxide

6.3.6 Background nitrogen dioxide concentrations have been estimated for each 1x1 km grid square in the region (Figure A). Values across the LEAP Area are summarised in Table 11, together with measurements by New Forest DC. All are below the new National Standard of 21 ppb. The national survey of nitrogen dioxide has shown that on average concentrations close to busy roads are around 70% higher than the background. On this basis the National Standard is likely to be exceeded close to busy roads when the background concentration is above 12 ppb. It is likely therefore that locations close to busy roads, especially in the area close to Southampton, will currently be above the Standard. The Objective is to meet this standard by the year 2005.

6.3.7 The guideline to protect vegetation is not exceeded in the forest area. However, the guideline for sphagnum dominated vegetation, of 6.2 ppb as an annual mean, is exceeded. The valley bog vegetation (*Erico-Sphagnion*) occurring in the valley mires is unusual in that such vegetation is normally confined to rain-fed mires and its occurrence in spring-fed mires in the New Forest and other valley mires in southern heathlands is anomalous in a European context and has not been satisfactorily investigated or explained. Its presence in valley mires indicates that the nutrient status of the mires is very low and in theory these should be very vulnerable to nitrogen pollution, although there is no field evidence of a current decline in oligotrophic *Sphagnum* communities of the New Forest.

6.3.8 Emissions of nitrogen oxides, which produce nitrogen dioxide, are projected to decline significantly in the next few years, and nitrogen dioxide concentrations can also be expected to decline, although there is no evidence yet of a downward trend. Emissions from point sources, i.e. chimneys, even large ones, generally make only a small contribution to annual mean concentrations, of <1 ppb.

Figure A: NO_2 Background Concentrations in the UK, 1994



Last updated 14 April 1997

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AEA Technology

Table 11 - Recent Measurements of Air Pollutants

LOCATION	TYPE OF SITE	CONCENTRATION	OBJECTIVE FOR 2005	TIMESCALE
Nitrogen Dioxide				
Lyndhurst	Roadside	15 ppb	21 ppb	Annual mean
Fawley	Background	11 - 12 ppb	21 ppb	Annual mean
LEAP Area	Background	9 - 16 ppb	21 ppb	Annual mean
Sulphur Dioxide				
Lyndhurst	Roadside	4 - 5 ppb	-	Annual mean
Fawley	Background	4 - 5 ppb	-	Annual mean
Marchwood	Background	3 ppb	-	Annual mean
Rockbourne	Rural background	1.3 ppb	4 ppb	Annual mean
Southampton	Urban centre	53 ppb	100 ppb	99.9%ile of 15-min means
Smoke				
Lyndhurst	Roadside	17 µg/m³	-	Annual mean
Fawley	Background	15 µg/m³	-	Annual mean
Marchwood	Background	15 µg/m³	-	Annual mean
PM_{10}				
Southampton	Urban centre	64 µg/m³	50 µg/m³	99%ile of highest daily running 24-h means
Southampton	Urban centre	22 µg/m³	-	Annual mean
LEAP Area	Background	15 - 20 µg/m³	-	Annual mean
Benzene				
Fawley	Background	0.55 - 1.85 ppb	5 ppb	3-month mean
Ringwood	Background	0.4 - 1.1 ppb	5 ppb	3-month mean
Lead				
Lyndhurst	Roadside	0.09 µg/m³	0.5 µg/m³	Annual mean
Fawley	Background	0.03 µg/m³	0.5 µg/m³	Annual mean

Notes : Benzene objective is a running annual mean
Rockbourne is just to the north-west of the LEAP Area
Estimated backgrounds are from a national pollution mapping exercise by DoE
A dash means no relevant standard exists

Sulphur dioxide

6.3.9 Concentrations of sulphur dioxide have fallen dramatically in the LEAP area since the 1960s (see Figure B). They are now well below the legal Limit Value. Recent measurements in the LEAP area and nearby are summarised in Table 11. Concentrations in the New Forest area are likely to be below the critical value to protect the more sensitive lichen species. However, there is ample field evidence of the past effects on epiphytic lichens of previously higher levels of sulphur dioxide. Winter means rather than annual means are critical for lichen protection as lichens are most effected when wet and physiologically active. In relation to effects on health, the limited monitoring in Southampton shows the new National Standard is not exceeded, but this site is 9km from the main sulphur dioxide emission at Fawley. There is a need to assess whether the National Objective is being exceeded closer to the Fawley complex [Issue No. M17]. The improvement programme instituted by the Agency will reduce sulphur dioxide emissions over the next few years and air quality should continue to improve.

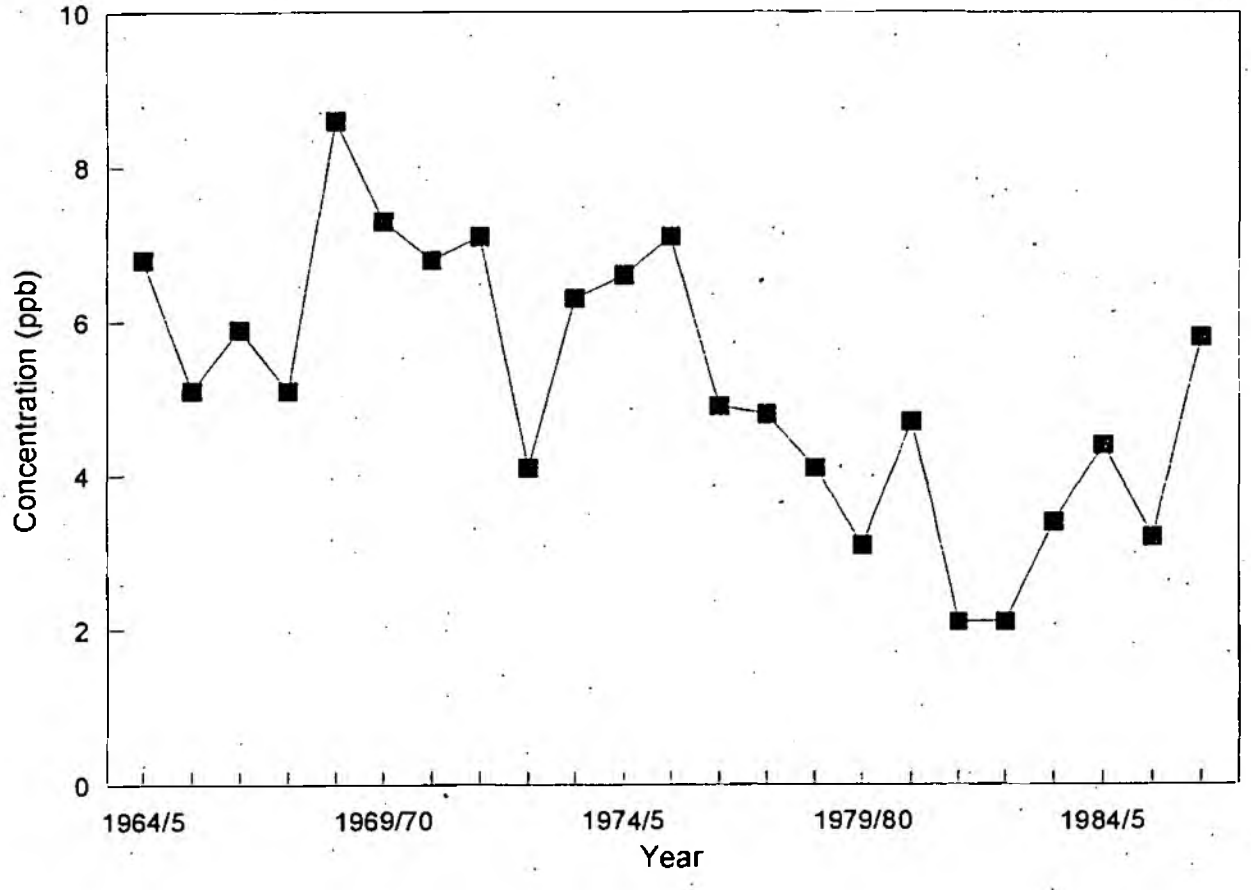


Figure B: Annual Mean Sulphur Dioxide Measured at Dibden Purlieu

Particulate Matter

6.3.10 Smoke concentrations have declined dramatically since the 1960s. Recent measurements by New Forest DC are summarised in Table 11. Concentrations are well below the Limit Value. The focus of attention is now on the measurement of PM_{10}. There has been no monitoring for PM_{10} in the New Forest LEAP area. Measurements made at a national site in the centre of Southampton show that the new National Standard for 2005 is currently being exceeded. Concentrations will be lower at background locations in the New Forest LEAP area, probably around 15-18$\mu g/m^3$, but somewhat higher close to busy roads. A decline in concentrations is projected, particularly as emissions from motor vehicles are projected to fall dramatically. There is uncertainty as to how great this decline will be, as there are many sources of PM_{10} emissions, most of which are poorly understood. One such source in the LEAP Area is the burning of the heather. PM_{10} arisings from waste management facilities are also poorly understood. [Issue No. S9].

Ozone

6.3.11 National monitoring has clearly shown that the highest concentrations and most frequent exceedances of the ozone standards are along the south coast of England. Ozone is a secondary pollutant, formed by chemical reactions involving hydrocarbons and nitrogen oxides, and driven by sunlight. Concentrations build up over several hours and are usually highest in rural rather than urban areas. Emissions hundreds of miles away over Europe often contribute to high ozone concentrations over southern England. Close to roads concentrations are low because the ozone is lost by reaction with nitric oxide emitted from motor vehicles.

6.3.12 No monitoring has been carried out for ozone in the LEAP area, and there are no nearby rural monitoring stations. Ozone can affect vegetation and human health. However, concentrations within the LEAP area are not known. Based on measurements some distance away, concentrations are likely to exceed the new National Standard on some 40-60 days every year. The Objective is not to exceed the Standard for more than 10 days a year by 2005. It is necessary to tackle ozone at a national and international level. However, local measures to reduce emissions of nitrogen oxides and VOCs will make a contribution.

Benzene

6.3.13 New Forest DC has carried out a 3-month survey of benzene concentrations using diffusion tubes at five locations in residential areas around the Fawley refinery, and at four residential locations in the town of Ringwood to the west of the LEAP area (Table 11). Concentrations are all well below the National Standard of 5ppb. It is projected that emissions from road traffic will decline significantly over the next few years. Further work is in hand to look at benzene concentrations around the Fawley refinery.

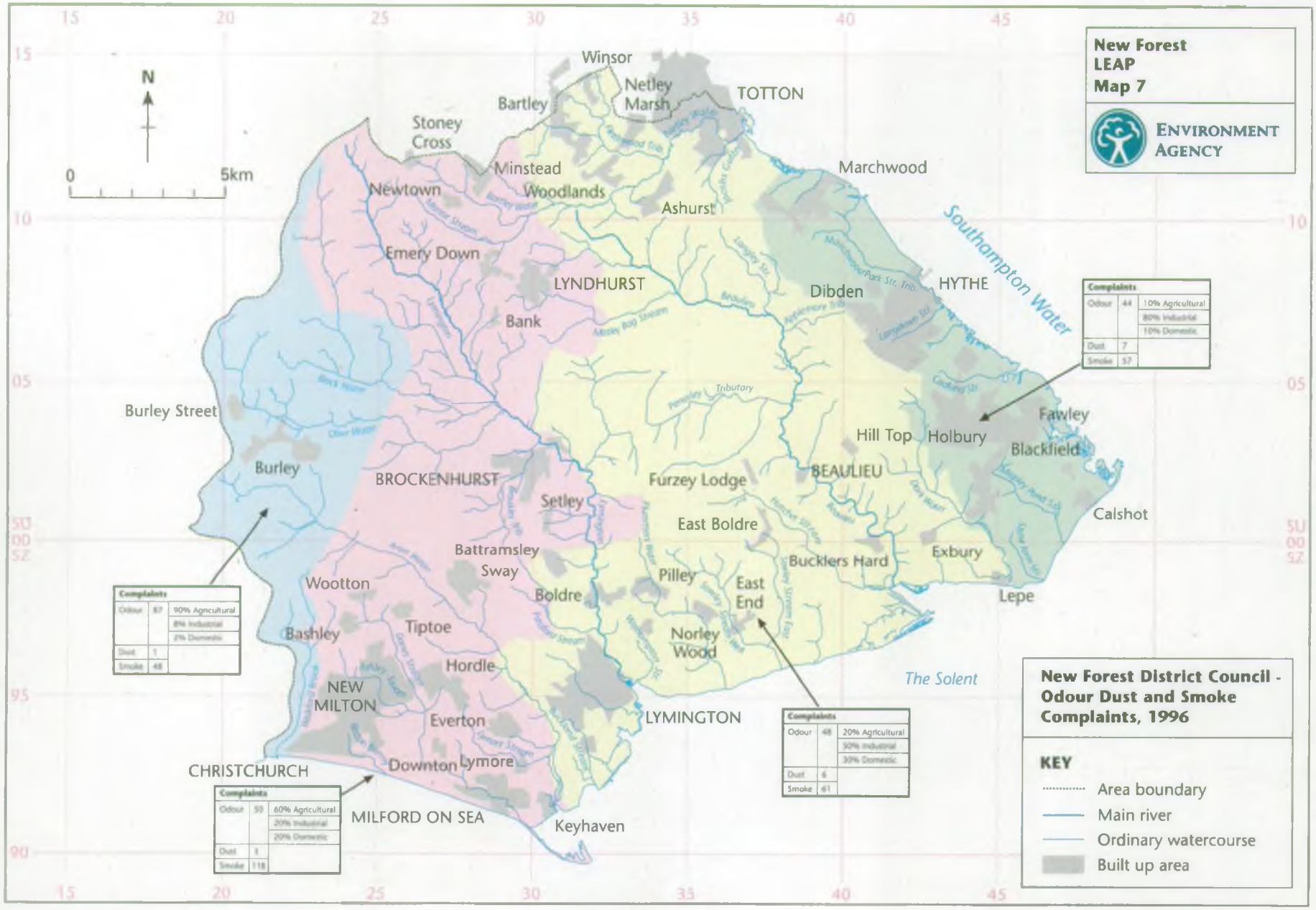
Lead

6.3.14 New Forest DC has monitored lead at two locations (Table 11). Annual mean concentrations are now well below the National Standard of 0.5µg/m^3. They will continue to fall as the use of unleaded petrol increases. There are no major industrial emissions of lead in the LEAP area.

Odours, Dust and Smoke

6.3.15 Odours, dust and smoke can all cause a nuisance. Smoke is monitored visually, and no industrial source is allowed to emit black smoke for more than 15 minutes (this is because control of combustion during start-up can be very difficult). There are methods for measuring the longer term deposition of dust, but such monitoring has not been carried out in the LEAP area because there are no particularly dusty emission sources. It is also difficult to interpret the results as there are no clearly established guidelines for nuisance dust.

6.3.16 Odours cannot easily be monitored using instruments. The human nose is the best detector, and records of complaints provide the best monitoring of this category of pollutants. The Agency receives complaints attributed to Part A processes and to Waste Management Facilities. In the period April 1996 to June 1997, 47 complaints were received about Part A processes, the majority relating to odour and associated with the Esso operations. [Issue No. M19]. These complaints are mostly close to the source. Esso has reported that 54% of the complaints they received that were attributable to their Fawley plant during 1996 were from Holbury, 29% from Fawley and 6% from Blackfield. Only 5% were from the Hythe/Dibden area. Further details of the complaints received by the Agency are provided in Table 12. This includes complaints which arise to the east of the main industrial area, across Southampton Water. Complaints also go directly to the plant operators, some of which may be for the same incidents, but details of the numbers are not available. New Forest DC also receive complaints. The numbers for their total area are shown in Map 7. There were 44 odour complaints in the more industrial parts and 185 in the rest of the Council's area. Smoke complaints were most frequent in the area that includes much of the New Forest. These are due mainly to the burning of domestic garden refuse.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Fawley
Blackfield
Calshot
East Boldre
Battramsley
Sway
Wootton
Boldre
Pilley
East End
Buckler's Hard
Exbury
Lepe
Bashley
Tiptoe
Hordle
Norley Wood
The Solent
NEW MILTON
Everton
LYMINGTON
CHRISTCHURCH
Downton
Lymore
MILFORD ON SEA
Keyhaven
Complaints
Odour 87 90% Agricultural
8% Industrial
2% Domestic
Dust 1
Smoke 48
Complaints
Odour 44 10% Agricultural
80% Industrial
10% Domestic
Dust 7
Smoke 57
Complaints
Odour 48 20% Agricultural
50% Industrial
30% Domestic
Dust 6
Smoke 61
Complaints
Odour 50 60% Agricultural
20% Industrial
20% Domestic
Dust 1
Smoke 118
New Forest District Council - Odour Dust and Smoke Complaints, 1996
KEY
Area boundary
Main river
Ordinary watercourse
Built up area

Table 12 - Summary of Complaints to the Agency Regarding IPC Processes in the LEAP Area: April 1996 - June 1997

PLANT OPERATOR	INDIVIDUAL COMPLAINTS			NUMBER OF INCIDENTS	NOTES
	TOTAL	CAUSE ESTABLISHED	CAUSE NOT ESTABLISHED		
National Power	2	1	1	2	Particulate matter, plume visibility
Esso Petroleum	39	24	15	26	Odour, soot deposits, particulate matter deposits
Exxon Chemicals	0	0	0	0	
Nalco/Exxon Energy Chemicals	0	0	0	0	
Enichem Elastomers	1		2	1	Odour
International Speciality Chemicals	1	1		1	Odour
Rechem International	1		2	1	Fallout
Bitmac	2	2		2	Odour
Marchwood Incinerator	2	2		2	Odour, particulate matter
South West Tar	0	0	0	0	

One incident could generate more than one individual complaint, hence the number of complaints always equals or exceeds number of incidents

Acid Deposition

6.3.17 Acids or acid-forming gases are deposited both in rainfall and by dry deposition onto surfaces. The significance is determined by the sensitivity of the soils and the vegetation, and varies from one area to another. Soils with a lot of chalk can readily neutralise the acid, whereas peaty or sandy soils can only neutralise small amounts and are thus more sensitive to acid deposition. For each soil there is an amount of acidic deposition that can be withstood without long-term damage. This is known as the 'critical load'. Comparing the amount of acid deposition with the critical load shows those areas where the critical load is exceeded. Exceedance maps of the UK have been prepared on a 1x1 km grid basis showing areas where sulphur related acid deposition exceeds the critical load for the soils characteristic of the grid square. The critical load is not exceeded over most of the LEAP area. However, there is a swathe running north-west to south-east through the centre of the area that does experience exceedance of the critical load, due to the sensitivity of the soils. [Issue No. M16].

Other Pollutants

6.3.18 No measurements of carbon monoxide or 1,3-butadiene have been carried out in the LEAP Area. However, based on experience elsewhere, concentrations are almost certainly below the National Standards, and can be expected to decline over the next few years, as the benefits of controls on vehicle emissions are seen. The one cautionary

note is that one of the industrial operators, Enichem Elastomers uses 1,3-butadiene. While it is not expected that concentrations are elevated around this works, there has been no monitoring to confirm this.

6.3.19 Polycyclic Aromatic Hydrocarbons (PAHs) have generated certain interest in the Southampton Water Area, due to the large concentration of industry. In 1994 HMIP commissioned a study of Air Quality in the Vicinity of Southampton Water, which looked at the sources of PAH emissions and available monitoring data. The report concluded that none of the Part A or Part B industries in the area would normally be associated with PAH emissions. Shipping is also unlikely to make a significant contribution. The most significant source is believed to be motor vehicle emissions, although wood burning, including the burning of the heathland could be a significant source. A limited amount of monitoring has been carried out using a total PAH analyser. This is of limited use, though, as the toxicity depends on the type of PAH present, and it is recommended that future monitoring should be for the individual species. More attention is likely to be paid to PAHs by local authorities and the Agency, once the Expert Panel on Air Quality Standards issues a report and once the European Commission proposes a Limit Value for PAHs, which will be by the end of 1999.

Radiation

6.3.20 New Forest DC is a member of the Southern England Radiation Monitoring Group which co-ordinates monitoring across the whole of southern England. Their eighth report, for the period November 1995 to October 1996, includes detailed results of sampling of honey, milk, seaweed, sediment, grass and fresh-water fish in the New Forest area. Along with results from other locations, the radioactivity of the samples was low, and well below the generalised derived limit values. Monitoring for gamma radiation in the New Forest area, as part of the Government's Radiation Incidents Monitoring Network has also shown consistently low levels. The report indicates that effluent from the UKAEA establishment at Winfrith, Dorset, is the main source of environmentally significant radioisotopes. The reactor closed down in the 1980s and discharges are now a small fraction of previous levels. There are four radioactive substance authorisations in the LEAP Area, Rechem International, Enichem Elastomers, Esso Petroleum and Fisher Instrumentation, none of which is significant source of radioactive discharges to water or emissions to air.

Nature Conservation Impacts

6.3.21 The New Forest is of international importance for lichens and mosses which are reliant on an exceptionally high air quality for their survival. Previously emissions were much higher, when Fawley power station and Esso were operating at higher levels and when Marchwood power station was also functioning. Old growth woodlands closest to the

sources of sulphur dioxide suffered serious damage in terms of losing sensitive ancient woodland species and some very sensitive species have declined across the Forest. Since the decline in sulphur dioxide pollution, common species have recolonised the lichen deserts which occurred outside of the open New Forest but little recovery can be expected in fragmented ancient woodlands. Lost ancient woodland species are unlikely ever to recolonise outside a timescale measured in centuries. Several very sensitive species have been totally lost since the 19th Century to air pollution and several more may yet be lost. The most sensitive species will not be protected by maintaining low annual means but will only be protected by keeping maximum levels very low. Short periods of high winter sulphur dioxide pollution are probably the most significant cause of very sensitive species losses.

6.4 Farming and Forestry

Farming

6.4.1 Over 80% of the land in England and Wales is farm land. The New Forest LEAP area is atypical and less than 30% of the land is under agriculture. The main agricultural zone of the LEAP area is in the southern coastal belt. Much of the area under agriculture is owned by large estates (commonly referred to as the Coastal Estate lands). Forty percent of this land is leased to tenant farmers.

6.4.2 Between 1982 and 1992 the overall area used for agriculture fell by 8.9% as a result of development pressure in the Waterside parishes and in the New Milton area. This land lost from agriculture may not necessarily have been built on but may rather have been used for recreational purposes such as golf courses or recreational grazing of horses.

6.4.3 The land in the Coastal Estate lands is productive and is under pressure from agricultural intensification. As identified in Section 6.6, agricultural intensification associated with horticulture and cereal production has led to a substantial increase in river water abstraction leading to low flows and associated degraded river water quality and riverine habitats.

6.4.4 Nationally the Agency is concerned about the deterioration of surface and groundwater from agricultural practices; these include:-

- Application of fertilisers causing high nitrate levels in groundwater and high nutrient levels in surface waters leading to algal blooms and eutrophication.
- High ammonia and coliform levels associated with slurry and dairying.
- Contamination of ground and surface waters by pesticides.
- The removal or mismanagement of riparian vegetation and land drainage and soil erosion from large ploughed areas can contribute to the silting of rivers and

streams, the choking of fish spawning grounds and loss of riparian habitats.

- The abstraction of water for spray irrigation and trickle irrigation causing low river flows and concurrent increases in concentrations of contaminants in our waters.

6.4.5 In general, a sustainable farming system that conserves the soil, limits the consumption of water, reduces the use of chemicals and minimises waste will reduce the risk of damage to the environment.

The Role of the Environment Agency

6.4.6 There are only a limited number of ways the Agency can influence how farmers use land. The Agency's main powers for the control of pollution from point sources on farms are the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991 which are contained within the 1991 Water Act. Other agencies such as the Ministry of Agriculture, Fisheries and Food (MAFF) can encourage sensitive farming practices using financial incentives. Sensitive farming practices intend to control diffuse pollution into rivers and groundwater. In particular, the Agency encourages, where appropriate, the implementation of buffer strips of natural vegetated land to protect rivers, river water quality and riparian habitats and has published guidance on their benefits. Financial incentives for farmers to create buffer strips are available under the Countryside Stewardship Scheme administered by MAFF.

6.4.7 The Agency can however, with respect to farming operations, control and prevent the direct discharge of pollutants to controlled waters in the same way as with any other industry. The Agency's duties and powers are to:-

- prevent and control pollution;
- deal with pollution incidents;
- issue and regulate consents to discharge from farms;
- license and regulate the abstraction of water for use on farms and set minimum river flow levels; and
- supervise matters relating to flood defence.

6.4.8 The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations require that Farm Waste Management Plans are produced in all instances. Farm Waste Management Plans demonstrate to the Agency that proper provision has been made for the storage and handling of silage, slurry and agricultural fuel.

6.4.9 Our range of work within the sphere of agriculture includes:-

- Abstraction licensing.

- Assessing the impact of farming on water quality.

- Designating groundwater protection zones and stopping certain activities within them. Nitrate Sensitive Areas (NSAs) and Nitrate Vulnerable Zones (NVZs) are examples of this. However, there are none of these zones within this LEAP area because of the minimal amount of groundwater abstraction and the lack of any major aquifers.

- Inspecting farms so that pollution may be prevented.

- Encouraging and developing best practices in land management.

- Working with other agencies such as MAFF to make the most of our pollution prevention work.

- Controlling riparian works on farm land.

- Developing Water Level Management Plans for environmentally important sites on Main Rivers.

- Giving flood warnings to mitigate damage to property and risks to stock.

Forestry

6.4.10 The New Forest LEAP area has a considerable woodland resource made up of the unenclosed woodlands of the open forest (Ancient and Ornamental Woodlands), the Forestry Commission timber inclosures and privately owned woodland. The Forestry Commission is responsible for the management of the Ancient and Ornamental Woodlands, as well as its timber inclosures.

6.4.11 The New Forest timber industry is an accepted part of the culture and landscape of the New Forest. Conifers are, inevitably, a major part of the Forest economy. However, the New Forest Review has recommended that the maximum feasible area of native broad-leaved component should be grown on the longest possible rotations and that ideally some conifer plantations should be restored to broad leaf.

6.4.12 Currently the total land area in the New Forest that is enclosed and managed as forestry amounts to 8,513ha. Of this area, 60% is conifer high forest and 40% is broad-leaved high forest. Timber production from the inclosures is currently in the order of 40,000m^3 per year. The New Forest is the second largest source of home-grown timber in the south of England.

6.4.13 The Forestry Commission has a statutory duty to manage the open Forest to maintain the grazing for commoners' animals. The New Forest Act of 1949 states that the Commission must ensure that *'the Forest will be properly drained, that culverts and bridges crossing drains or streams ..... will be properly maintained and that grazing will be kept sufficiently clear of coarse herbage, scrub and self-sown trees.'* The requirement to keep the Forest *'properly drained'* is clearly contrary to the habitat and

conservation requirements of the Forest and the purpose of the cSAC designation under the Habitats Directive. Drainage is highly damaging to mire habitats and the Agency, English Nature and the Forestry Commission have worked together to substantially reduce and more recently to stop further mire and valley drainage in the Forest. [Issue Nos. M2, S1].

6.4.14 In general, well managed woodland in the right places does not harm the water environment and will often bring benefits by reducing run-off. However, in some circumstances woodland planting and management can cause problems through acidification, soil erosion, increased flood risk and damage to wildlife habitats.

6.4.15 To this end, the Forest Authority regulates forestry in the UK by licensing some operations using felling licences and providing grant aid through the Woodland Grant Scheme. The Forestry Authority has published a series of guidelines on forests and water, nature conservation, landscape design, archaeology and recreation which encourage environmentally sympathetic planting, management and harvesting. The Farm Woodland Premium Scheme operated by MAFF also provides grant aid for new woodlands on farms.

6.4.16 The Agency's objective with regard to forestry is to protect the water environment from the negative effects of forestry activities (for example, the blockages to migrating fish passage caused by brush cuttings washed into rivers when in spate) and to encourage forestry practices that improve the water environment. To this end, the Agency has duties and powers to:-

- regulate some forestry works using land drainage legislation;
- deal with pollution incidents.

The Agency's work in the sphere of forestry includes:-

- Working with the Forestry Authority and local authorities to ensure that the most significant forestry schemes consider effects on the water environment. We welcome the opportunity to comment on these schemes and on Indicative Forestry Strategies where they are being developed.

- Identifying areas that might be sensitive to the planting of forests to the Forestry Authority, Forest Enterprise and local authorities. Clearly this includes most of the LEAP area as designated SSSIs.

- Significant planting within Main River floodplains needs the consent of the Agency under land drainage bylaws. With the Forestry Authority we are looking at the prospects for new floodplain woodlands in the lowlands of England and Wales and considering their potential impact on flood storage.

- Promoting the Forest and Water Guidelines with Agency staff and developing

'best practice' techniques further through our research and development programme.

- Working with the Forestry Authority to improve the way we consider the environmental impact of proposed forestry schemes. At the moment only new planting schemes require an Environmental Impact Assessment, but large-scale woodland management activities can cause as much damage to the water environment as new planting schemes.

6.5 Waste Disposal

Waste Regulation

6.5.1 The Agency regulates the recovery, treatment and disposal of controlled waste through the Waste Management Licensing Regulations of the Environmental Protection Act 1990. Controlled waste is defined as household, industrial and commercial waste and includes waste collected from residential properties, shops, offices and factories. Agricultural waste and mines and quarries waste are covered by other legislation.

6.5.2 Waste management facilities include landfill sites, transfer stations, civic amenity sites, incinerators, scrapyards, recycling operations and treatment plants. The development of any such facility will normally be decided through the land-use planning system that is administered by local planning authorities under the Town and Country Planning Act 1990. The Agency has a role to play as a statutory consultee in the planning process.

6.5.3 In addition to planning consent, the operation of a waste facility will normally require a Waste Management Licence. The Agency administers the waste management licensing system, which aims to ensure that facilities:-

- do not cause pollution of the environment;
- do not cause harm to human health;
- do not become seriously detrimental to the amenities of the locality.

6.5.4 In assessing pollution, the Agency must have regard to the impact of emissions on the local environment, including air, water, soil, flora and fauna, as well as wider considerations such as global warming.

6.5.5 Certain types of operations involving controlled waste with a low pollution potential may be exempted from waste management licensing. The Agency is responsible for registering such exemptions.

Sustainable Waste Management

6.5.6 The Government's strategy and targets for sustainable management of controlled

and other waste is set out in a White Paper entitled 'Making Waste Work' (also referred to as the National Waste Strategy).

6.5.7 The strategy is based on three key objectives:-

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

6.5.8 To help achieve those objectives a hierarchy of waste management options (or the waste hierarchy) has been developed to give a broad indication of their relative potential risk to the environment. The hierarchy is as follows:-

- Reduction
- Re-Use
- Recovery, comprising:-
  - recycling
  - composting
  - energy recovery
- Disposal

6.5.9 The objective of the strategy is to increase the amount of waste managed by options towards the top of the hierarchy, that is away from disposal towards re-use and reduction. Currently most waste is managed by methods at the bottom of the hierarchy, principally disposal at landfill sites. Recycling, composting and energy recovery have begun to play a more significant role as the strategy begins to take effect.

6.5.10 Cost effectiveness and the nature of certain materials will mean that some wastes will be unsuitable for reduction, re-use and recovery. For each waste stream there will be a Best Practicable Environmental Option (BPEO) which will take account of economic as well as environmental factors.

6.5.11 Increasing sustainability and the waste hierarchy are central to the Agency's role in waste management. Through effective waste regulation, relevant research and the provision of waste management data, statistics and other information, the Agency will play a key role in helping to deliver the targets set out in the strategy.

6.5.12 In addition to the work of the Agency, the Government has introduced the Landfill Tax. This provides a financial incentive to move away from landfill disposal.

6.5.13 A further instrument to increase the re-use and recovery of waste is the introduction of regulations which set targets for the monitoring and recovery of packaging waste. The Agency's role will be to register packaging waste producers and monitor performance.

Waste Management Planning

6.5.14 Waste management planning provides a framework for the private and public sectors to make decisions for the minimisation, recovery and disposal of waste in a way that safeguards the environment. It is concerned primarily with the strategic aspects of reducing, treating and disposing of controlled waste at the regional and national level.

6.5.15 The Agency is involved in the assessment of options for the transport, treatment and disposal of waste. This entails the collection, analysis and publication of waste management data at local, regional and national levels on:-

- quantities of waste;
- sources of waste;
- costs of different waste management options; and
- environmental effects.

6.5.16 Local planning authorities use this information in the preparation of statutory Waste Local Plans which make appropriate provision for waste management in relevant areas.

Waste Management Within the LEAP Area

Arisings and Recycling

6.5.17 Statistics on waste arisings and recycling are not collected or collated for the area defined by the LEAP. New Forest District Council collect an estimated 44,500 tonnes of household and commercial waste (Municipal Year Book 1997), and the majority of this will arise within the LEAP area. There are no comparable figures available for commercial, industrial or other types of waste.

Licensed Facilities

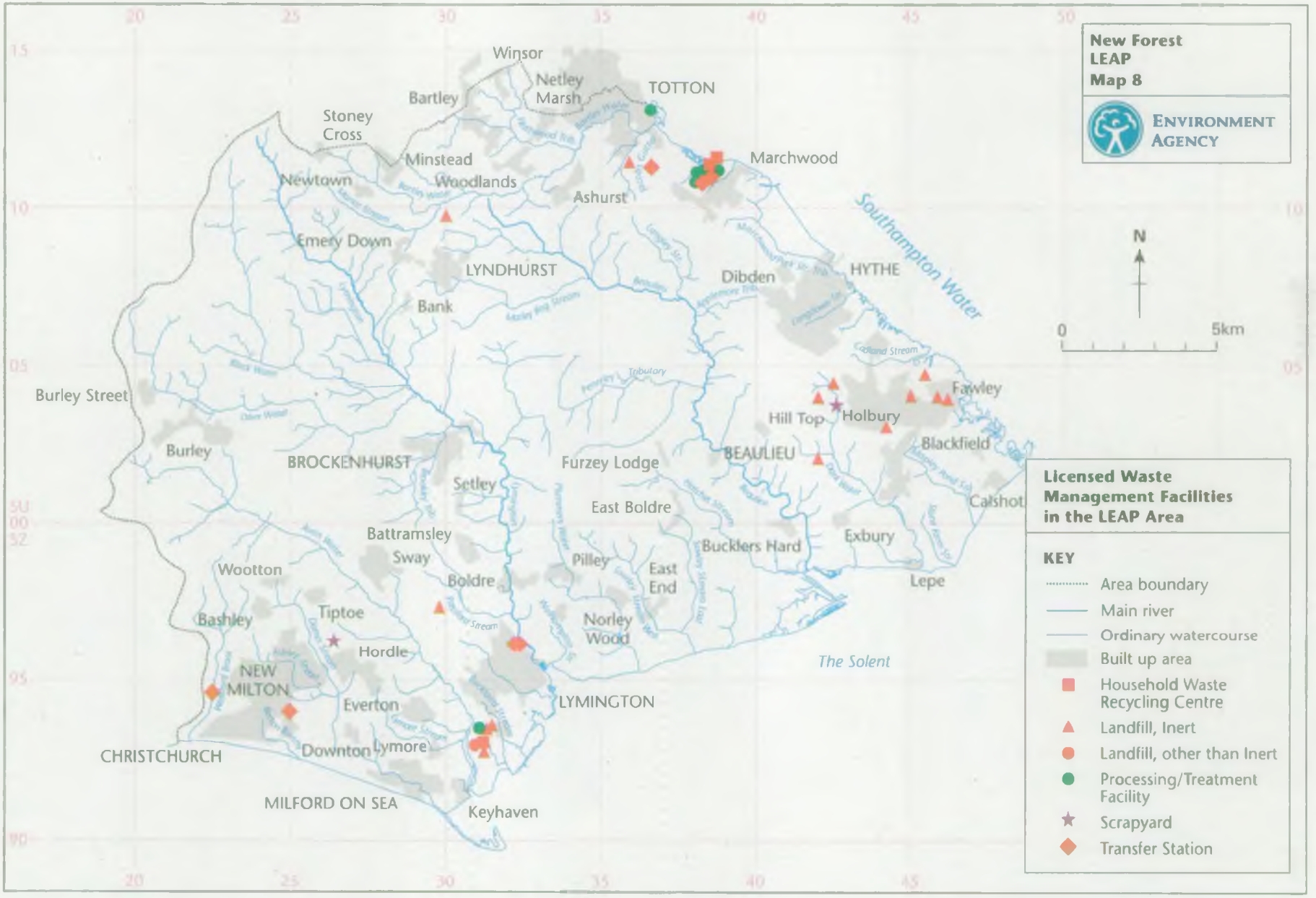
6.5.18 Table 13 gives details of the currently licensed waste management facilities that are located within the LEAP area and these are shown on Map 8.

Table 13 - Licensed Waste Management Facilities within the LEAP Area

LICENCE REF.	SITE NAME AND LOCATION	NGR	TYPE OF FACILITY	TYPE OF WASTE
NF 42a	Efford, Lymington (ARC)	312 928	Landfill	A, B, C
7/45	Holbury II, Holbury	420 040	Landfill	A, B, C
NF 51(i)	Lymington Road, New Milton	225 946	Transfer Station	A, B
7/56	Esso Refinery, Fawley	458 040	Landfill	A
7/58	Esso Refinery, Fawley	454 047	Landfill	D2
7/66	Esso Refinery, Fawley	462 039	Landfill	A, B
NF 73f	Manor Farm, Pennington	313 935	Landfill Recycling Facility Transfer Station	A
N 73(i)	Manor Farm, Pennington	315 935	Landfill	A
7/77	Lime Kiln Lane, Holbury	203 303	Scrapyard	D3
7/93a	Slowhill Wastewater Treatment Works	384 112	Treatment	D2
7/116a	Pitmore Lane/North Common Lane, Sway	298 973	Landfill	A
NF 121a	Distributor Road, Marchwood	385 114	HWRC	C
NF 122	Milford Road, Pennington	311 931	HWRC	C
N 170	Vaggs Lane, Hordle	264 963	Scrapyard	D3
NF 182a	The Tank Farm, Marchwood	384 112	Processing	D2
NF 193	Recycling Storage Bays, Marchwood	384 120	Transfer Station	C
NF 205a	Marsh Lane Depot, Lymington	324 962	Transfer Station	A
NF 205 (i)	Lymington Transfer Station	324 962	Transfer Station	C
NF 219	Marchwood Incinerator	384 110	Transfer Station	C

Waste Type

A	Inert wastes
B	Commercial and industrial wastes
C	Household wastes
D2	Liquid difficult wastes
D3	Scrap metal
HWRC	Household Waste Recycling Centre


New Forest
LEAP
Map 8
Environment Agency
N
0
5km
Winsor
Netley Marsh
Bartley
TOTTON
Stoney Cross
Minstead
Marchwood
Newtown
Woodlands
Ashurst
Southampton Water
Emery Down
LYNDHURST
Dibden
HYTHE
Bank
Burley Street
Fawley
Hill Top
Holbury
Blackfield
Burley
BROCKENHURST
Furzey Lodge
BEAULIEU
Setley
East Boldre
Calshot
Battramsley
Sway
Pilley
Bucklers Hard
Exbury
Wootton
Boldre
East End
Lepe
Tiptoe
Bashley
Norley Wood
Hordle
The Solent
NEW MILTON
Everton
LYMINGTON
CHRISTCHURCH
Downton
Lymore
MILFORD ON SEA
Keyhaven
Licensed Waste Management Facilities in the LEAP Area
KEY
Area boundary
Main river
Ordinary watercourse
Built up area
Household Waste Recycling Centre
Landfill, Inert
Landfill, other than Inert
Processing/Treatment Facility
Scrapyard
Transfer Station

6.5.19 The main facility in Table 13 above which has the potential for significant environmental impact is the landfill site at Efford adjacent to the Pennington Marshes. This is a large site that has received substantial quantities of household and other wastes over many years. The excavation of gravels and replacement with waste partly in contained areas has led to a number of environmental problems which are described in more detail in other sections:-

i) Reduced surface water quality in the Pennington Marshes from leachate contamination egressing unlined areas. [Issue No. M11].

ii) Reduced groundwater flow into the Pennington Marshes due to impedance of flow by clay lined cells. [Issue No. M11].

6.5.20 A further significant waste facility that is regulated under air quality (IPC) legislation (and therefore not listed in Table 13) is the Rechem incinerator at Fawley. The facility is of international importance for the treatment and disposal of hazardous waste, with imports received from the whole of the UK as well as overseas. In a local context, relevant wastes from the Esso Refinery are also disposed of here.

Exempt Sites

6.5.21 There are a significant number of waste management related sites and operations that have been registered as exemptions from waste management licensing. These are summarised in Table 14 below.

Table 14 - Registered Exemptions from Waste Management Licensing

TYPE OF OPERATION	OPERATORS/ FACILITY	NO. OF EXEMPTIONS REGISTERED
Temporary storage of waste pending collection/recovery/reuse	South West Trains Utilities Commercial & industrial concerns	23
Agricultural	Farms	2
Waste Medicines Storage	Pharmacies	32
Aluminium Can Storage	Can Banks	47

6.5.22 In certain circumstances, the disposal of wastes, such as sewage sludge and other organic matter, by spreading on agricultural land may be exempted. This activity is not widespread in the LEAP area, but it does have a significant pollution potential if not adequately controlled. Through the registration procedure, the Agency ensures that the relevant criteria for exemption are met.

Recycling, Reuse and Reduction

6.5.23 The Agency supports a number of waste minimisation initiatives based on a county-wide approach, but which cover the LEAP area. The aim is to inform and encourage businesses in waste minimisation and re-use. The possibility of the Agency offering free waste stream analysis is also being considered; and this may form part of a national scheme.

6.5.24 The Hampshire Minerals and Waste Local Plan identifies the site of the Marchwood Power Station as a suitable location for the development of a new waste-to-energy plant for largely household waste. The new plant will contribute to the overall achievement of the aims of the waste strategy. The Agency will have an important role as a statutory consultee during the planning stage for this development.

Other Issues

6.5.25 Other areas where the Agency has a role in waste management issues in the LEAP area are:-

- *Oil Pollution* - the Agency is concerned with the disposal of oil from spills. The Agency also liaises with local authorities and gives advice on the disposal of drums washed up on beaches, including sample analyses of contents.

- *Fly Tipping* - the Agency seeks to control fly tipping by identifying and taking action against offenders. Whilst there is currently little evidence of any major problem within the LEAP area, the pressure exerted by the Landfill Tax is expected to lead to an increase in fly tipping generally.

6.6 Water Abstraction

6.6.1 This section considers the abstraction of water from the surface (rivers and lakes) and below ground (boreholes and wells) for public water supply, farming, industry and other approved uses, the nature and state of the resource, the balance of supply and demand and the effect on the environment of abstraction.

6.6.2 The role of the Agency is to manage the exploitation of the water resource available in the LEAP area. The Agency has duties and powers to ensure that water is used properly. This is done through abstraction licences by which the Agency may regulate consumption and therefore conserve water supplies and protect them from over-use. This is particularly important in the New Forest LEAP area as over-abstraction of water affects more than just riverine habitats.

6.6.3 Of particular concern in the LEAP area is the question of target river flows and in consideration of new abstraction licence applications the Agency will set minimum river flow (MRF) conditions. The Agency may establish these flow conditions on the

basis of environmental impact on ecological habitat and fishing requirements, as well as existing abstractions, using a predictive model (PHabSim). More routinely, the Agency sets minimum river flows at that rate of flow which would be expected to be exceeded 95% of the time (Q95). Where it is evidently necessary to increase the flow rate above the Q95 level, then the Agency may do so as appropriate.

Local Perspective

6.6.4 The total amount of water that may be abstracted by the current licensed abstractions in the LEAP area is 2.3 million m^3.

The water that is abstracted within the LEAP area is used for:-

- public and private water supply
- spray and trickle irrigation
- general agricultural use
- fish farming
- gravel washing
- industry

6.6.5 Of the total licensed water abstraction, 43% is for public water supply and 39.3% for spray irrigation.

6.6.6 The actual consumption of water in 1994/95 was 56% (1,310,410m^3) of the licensed quantity.

Licensed Abstraction Demand

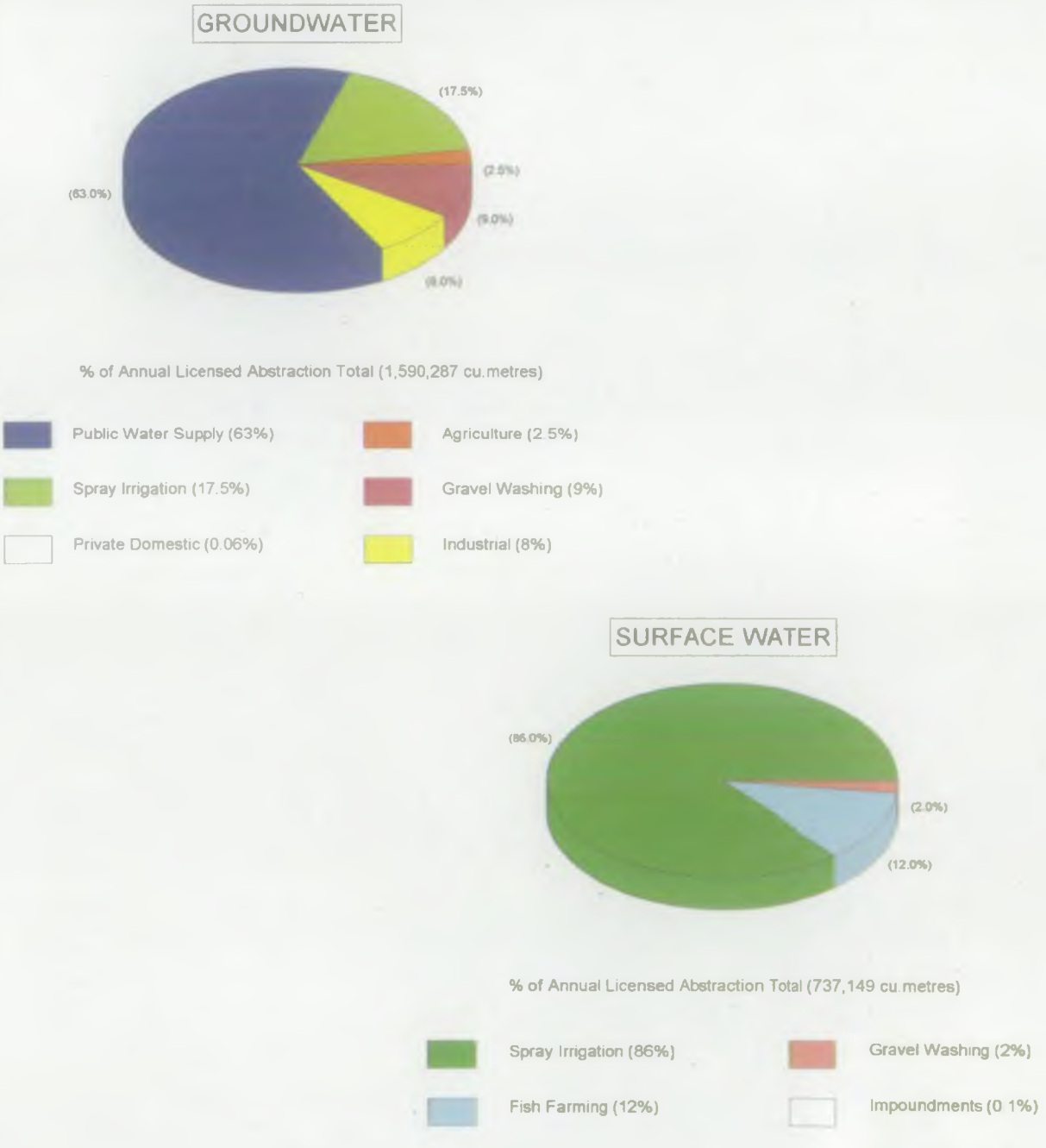
6.6.7 Tabulated below (Table 15) is a summary of all licensed abstractions in the LEAP area according to use.

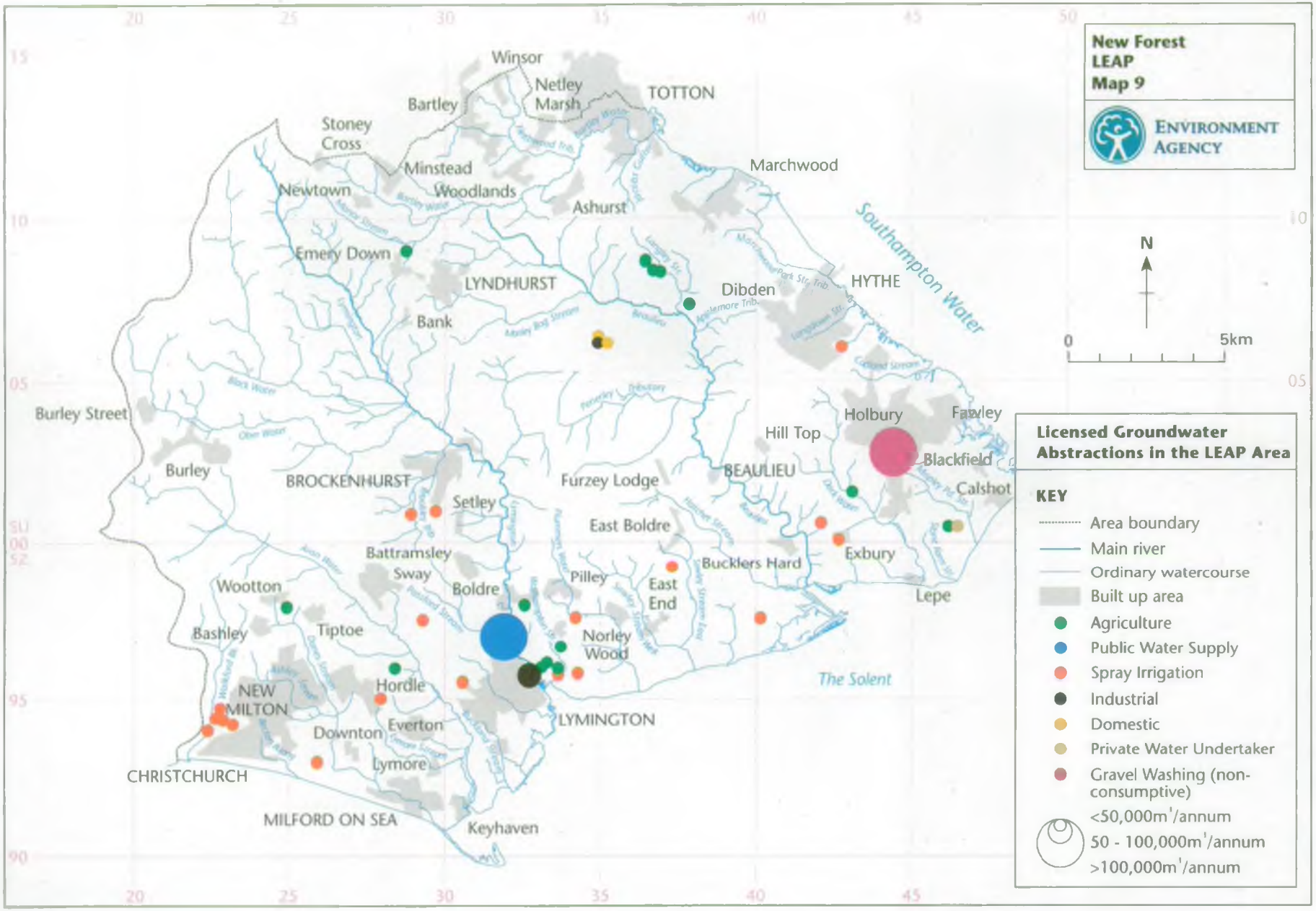
Table 15 - Licensed Abstractions in the LEAP Area

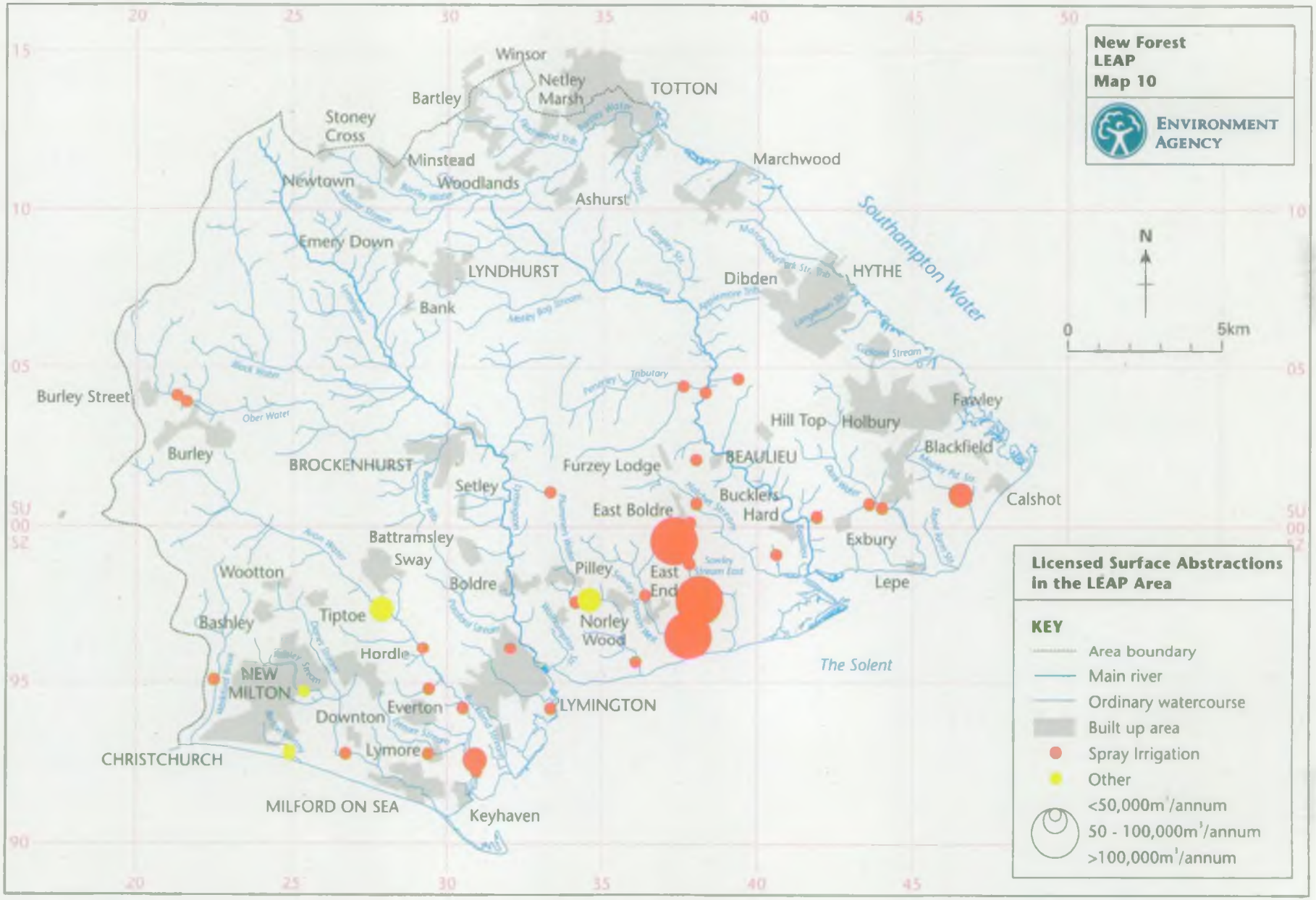
	GROUNDWATER		SURFACE WATER			
USE	NO. OF LICENCES	VOLUME (m^3/annum)	NO. OF LICENCES	VOLUME (m^3/annum)	TOTAL (m^3/annum)	%
Agriculture	9	40,870	0	-	40,870	1.76
Public Water Supply	2	1,000,484	0	-	1,000,484	43.00
Spray Irrigation	15	277,811	22	636,933	914,744	39.30
Industrial	3	131,106	0	-	131,106	5.60
Private Domestic	1	909.00	0	-	909.00	0.04
Gravel Washing	1	139,108	1	8,296	147,404	6.30
Fish Farming	0	-	1	90,920	90,920	3.90
Impoundments	0	-	1	1,000	1,000	0.04

6.6.8 Figure C shows, perhaps more clearly, the breakdown of licensed water use within the LEAP area. It should be noted that gravel washing and fish farming are considered as non-consumptive water uses as the water used is returned to its source after utilisation. Gravel washing and fish farming account for approximately 15% of the water currently abstracted in the LEAP area under licence. Map 9 shows the significant groundwater abstractions in the area, whilst Map 10 shows the significant surface water abstractions.

Figure C: Water abstraction: Supply and consumption
New Forest Leap Area




New Forest
LEAP
Map 9
ENVIRONMENT AGENCY
N
0
5km
Licensed Groundwater Abstractions in the LEAP Area
KEY
Area boundary
Main river
Ordinary watercourse
Built up area
Agriculture
Public Water Supply
Spray Irrigation
Industrial
Domestic
Private Water Undertaker
Gravel Washing (non-consumptive)
<50,000m³/annum
50 - 100,000m³/annum
>100,000m³/annum
Winsor
Netley Marsh
TOTTON
Bartley
Stoney Cross
Minstead
Newtown
Woodlands
Marchwood
Ashurst
Southampton Water
Emery Down
LYNDHURST
Dibden
HYTHE
Bank
Burley Street
Holbury
Fawley
Hill Top
Blackfield
Burley
BROCKENHURST
Furzey Lodge
BEAULIEU
Calshot
Setley
East Boldre
Battramsley
Sway
Pilley
East End
Bucklers Hard
Exbury
Lepe
Wootton
Boldre
Bashley
Tiptoe
Norley Wood
The Solent
NEW MILTON
Hordle
LYMINGTON
Everton
Downton
Lymore
CHRISTCHURCH
MILFORD ON SEA
Keyhaven


New Forest
LEAP
Map 10
ENVIRONMENT AGENCY
N
0
5km
Winsor
Netley Marsh
TOTTON
Bartley
Stoney Cross
Minstead
Woodlands
Newtown
Ashurst
Marchwood
Southampton Water
Emery Down
LYNDHURST
Dibden
HYTHE
Bank
Burley Street
Burley
BROCKENHURST
Furzey Lodge
BEAULIEU
Hill Top
Holbury
Fawley
Blackfield
Calshot
Setley
Buckler's Hard
East Boldre
Exbury
Lepe
Battramsley
Sway
Pilley
East End
Boldre
Woottton
Tiptoe
Norley Wood
Bashley
Hordle
NEW MILTON
The Solent
Everton
LYMINGTON
Downton
Lymore
CHRISTCHURCH
MILFORD ON SEA
Keyhaven
Licensed Surface Abstractions in the LEAP Area
KEY
Area boundary
Main river
Ordinary watercourse
Built up area
Spray Irrigation
Other
<50,000m³/annum
50 - 100,000m³/annum
>100,000m³/annum

Public Water Supply

6.6.9 Demand is focused on Brockenhurst, Lyndhurst and the waterside villages of Lymington and New Milton. Southern Water Services (SWS) and Bournemouth & West Hampshire Water (BWHW) provide mains public water supply within the LEAP area. The SWS supply area covers the north-eastern half of the LEAP area and includes the Waterside villagesas well as Lyndhurst and Brockenhurst. BWHW supply the remainder of the LEAP area including Beaulieu, Lymington, New Milton and Bransgore. However, all the mains water supplied by SWS is abstracted from outside of the LEAP area and BWHW only have one abstraction in the LEAP area, namely the groundwater abstracted from deep wells at the Ampress Works just north of Lymington. Here groundwater has been abstracted from a confined aquifer in the Bracklesham Formation since the turn of the century.

6.6.10 The Ampress Works have two licences; one for abstraction from the deep, confined Bracklesham aquifer and one from the shallow Barton Sands. Because of contamination, probably from old steelworks and chromium plating processes adjacent to the site, abstraction from the shallow aquifer ceased in 1989. The extent of pollution is not clearly defined and the Agency will require appropriate remediation of the site prior to any further redevelopment of the site. [Issue No. S6].

Other Licensed Users

6.6.11 Of particular interest and significance is the changing pattern of consumption over the past 10 years. This is summarised in Table 16 below.

Table 16 - Changing Pattern of Usage of Abstracted Water

USE	ACTUAL CONSUMPTION (m^3/annum)		
	85 / 86	89 / 90	94 / 95
Agriculture	2,482	5,908	2.00
Public Water Supply	731,951	406,771	631,091
Spray Irrigation	51,308	207,560	407,345
Industrial	637.00	66,695	93,937
Private Domestic	540.00	654.00	485.00
Gravel Washing	146,374	140,525	137,968
Fish Farming	662.00	54,819	39,582
Totals	**933,954**	**882,932**	**1,310,410**

6.6.12 Of note is the sharp rise in consumption by spray irrigation, which has increased eight-fold over the past 10 years. Sixty-percent of abstraction for spray irrigation is from

surface water sources. Spray irrigation is an almost exclusively summer activity and the demand for water from the relatively minor waters in the LEAP area can lead to problems of low flow. Many recently issued licences will contain conditions to restrict abstraction when water resources are limited. In this way the environment is protected from increased demand in drought periods. Many surface spray irrigation licences are linked to minimum river flow conditions which restrict or stop abstraction when river flows fall below a certain level. Although winter storage schemes are actively encouraged, direct abstraction from streams to fill the reservoirs is only allowed when levels exceed an agreed level. However, Licences of Right issued in the 1960s are seldom restricted by environmental conditions and in the most extreme case these licences authorise the abstraction for spray irrigation of quantities greater than the summer flow in a New Forest stream. This is a particular problem in the Avon Water and the Walkford Brook. Minimum flow precautions have been taken by erecting a weir to measure flows and regulate abstraction on Walkford Brook. We also consider that Danes Stream, Plummers Water, the Beaulieu River, Dark Water, Stanwood Stream and Sowley Stream are watercourses at risk from abstraction under conditions of declining rainfall.

6.6.13 Over the past few years we have had to make a number of prosecutions that relate to breach of licence conditions and illegal abstraction from surface waters for spray irrigation. In one instance, an illegal impoundment (or dam) was made so as to artificially raise the river level above the minimum flow level and so allow an irrigation reservoir to fill. Opportunities are taken to reduce the licensed commitment on the New Forest rivers and to transfer demand from summer abstraction to winter storage.

Trickle Irrigation

6.6.14 There is concern in the LEAP area about the use of trickle irrigation. Trickle irrigation schemes do not currently require an abstraction licence and therefore the Agency has no control over the amount of abstraction from a surface watercourse or an aquifer during summer months. It is estimated that there are at least five trickle irrigation schemes currently operating in the LEAP area; the licensing system is currently under review by the DETR [Issue No. M1]. Trickle irrigation is less consumptive of water than spray irrigation and a wholesale conversion of the agricultural industry to trickle irrigation, if properly assessed and licensed, would ultimately be beneficial to the environment and help conserve water resources.

Future Demand

6.6.15 The growth in any future demand is most likely to arise from:-

- further housing development which under current plans can be supplied within existing licences;
- increased abstraction requirements for farming.

6.6.16 It is our policy that further agricultural demand will be met by the development of winter storage schemes. Winter storage schemes aim to capture and store the excess river flow produced by prolonged or high rainfall events that generally occur in the wetter winter months. So far, four winter storage schemes, with a combined storage capacity of 86,362m³, have been created within the LEAP area. Three of these are licensed for spray irrigation on the coastal estates; the other is licensed for golf course watering. Two further applications for spray irrigation are under consideration with a combined winter storage capacity of 34,227m³. However, the Agency is aware of the need to monitor and assess the impact of all proposed winter storage schemes on both the landscape and on archaeological sites.

6.6.17 The recent decline in annual rainfall and the probability of long-term climate change will influence the balance of water resources in the New Forest, where wetlands and small river systems are particularly vulnerable. Licences of Right, issued in the 1960s under very different conditions, may be reassessed, and those few licences granted in the future will be time-limited and will contain restrictive conditions.

Nature Conservation Impacts

6.6.18 Although low summer flows in New Forest rivers are a natural occurrence, such conditions still place considerable stress upon the associated flora and fauna. Any abstraction which further reduces flow will therefore increase these stresses. Water quality will be vulnerable to changes such as reduced oxygen levels or increased concentrations of plant nutrients such as phosphates where waste water treatment works discharge into the system (see Section 6.7). Extremes in water quality, together with physical changes such as increased silt deposition, or even complete drying out of the river bed, will inevitably impact upon specialist plants and animals with the subsequent loss of biodiversity. The influence of extreme low flows is likely to be felt right to the seaward end of these systems where the quantity as well as quality of water being discharged into estuarine waters is a critical factor influencing the upstream passage of migratory fish such as sea trout.

6.6.19 New Forest rivers are amongst the most natural in Britain, and as such they are allowed to exhibit a dynamism seldom found in other rivers. Spate flows make significant changes to a river's course and geomorphological characteristics on an annual basis and are responsible for the seasonal flooding of adjacent land and creation of those ephemeral water bodies discussed in Section 3.8. The effect of abstraction for winter storage on these spate flows might be to reduce the influence they currently have on shaping and reshaping these dynamic systems by actually increasing the levels of stability. Increased stability could be as damaging to the overall biodiversity and character of New Forest rivers as excessive low flows. Care must therefore be taken to recognise the importance of spate flows and not rely entirely on Q95 or even Q50 values to protect the nature conservation interest of these rivers.

6.7 Effluent Discharges

6.7.1 This section considers the effect on the environment and the available water resource of the disposal of effluent to rivers, estuaries, the sea or groundwater. Effluent, by definition, includes a range of discharges from sewage treatment plants, through to rainwater discharge from storm water balancing ponds.

The Role of the Environment Agency

6.7.2 The Agency regulates effluent discharges made to controlled waters under the terms of the Water Resources Act 1991. Standards are applied to the discharges to protect the quality of the receiving waters. These standards are enforced as conditions relating to chemical and physical concentrations/limits and volume. By regulating discharges the Agency can:

- maintain and improve the water quality;
- enhance the aquatic environment;
- meet water quality objectives.

6.7.3 Discharges to water, air or land from the larger industrial processes (Part A Processes) are regulated under Integrated Pollution Control System.

6.7.4 In fulfilment of the above objectives, the Agency has duties and powers laid down in the Water Resources Act 1991 to:-

- Authorise discharges through a system of consents or IPC authorisations where appropriate. Applications for consent to discharge are considered on a case-by-case basis and the Agency can refuse to consent a discharge if it will cause an unacceptable deterioration in water quality.

- Monitor consent compliance. Failure to comply with any consent conditions may result in prosecution.

- Influence investment in sewerage and sewage treatment by the water companies in line with Asset Management Plan guidelines. An Asset Management Plan is a strategic business plan which includes the improvement of the quality of waste water treatment works (WWTWs) discharges to EC Standards based on guidelines agreed between the Environment Agency, Department of Environment, Transport and the Regions, the water service companies and OFWAT (the water industries economic regulator).

It is illegal and an offence under the terms of the Water Resources Act 1991 to make a discharge without a consent.

6.7.5 To fulfil the duties and exercise the powers conferred by legislation, the Agency:-

- liaises with planning authorities to advise on sewage disposal;
- liaises with trade dischargers and water service companies, carries out regular site inspections and monitors discharge quality; and
- constantly reviews and develops water sampling strategies to obtain a comprehensive picture of water quality in rivers, estuaries, groundwaters and coastal waters.

Local Perspective

6.7.6 Discharge consents only apply to point source discharges i.e. discharges made via a pipe at a fixed location. Diffuse pollution or non-point discharges cannot be controlled by consent under the terms of the Water Resources Act 1991. Nutrient enrichment and siltation of rivers and estuaries have been recognised as a national problem.

6.7.7 There are three types of consented discharge in the LEAP area:-

- Continuous : from sewage and trade effluent
- Intermittent : sewage discharges made in storm and emergency conditions
- Discharges to ground : sewage and trade discharges made to underground strata. (This could be made via a soakaway)

6.7.8 Where possible, continuous discharges are connected to the public foul sewerage system for treatment at Southern Water Services waste water treatment works (WWTW). Nationally, the Environment Agency has a policy to discourage the proliferation of small private treatment plants in favour of mains connections where this is possible.

Waste Water Treatment Works in the LEAP Area

6.7.9 Asset Management Plans (AMPs) are nationally agreed strategic programmes which Water Companies must implement in order to improve the level of treatment and the quality of the discharge. These improvements are needed so that the quality of the water environment can be improved in accordance with such directives as:

- EC Bathing Waters Directive
- EC Urban Waste Water Treatment Directive
- EC Freshwater Fish Directive
- EC Shellfish Waters Directive

6.7.10 The main driving mechanisms are the EC Bathing Waters and the EC Urban Waste Water Treatment Directives which requires all sewage to undergo improved treatment. WWTWs which only provide primary screening and maceration of solids followed by long sea outfall are not allowed in the LEAP area under the Directive. All WWTWs will require a level of secondary treatment to reduce the level of biological oxygen demand (BOD) and suspended solids to a level appropriate to the receiving waters.

6.7.11 Most inland WWTWs in the LEAP area conform with EC Directives and UK Statutory Regulations. Therefore little investment through AMPs has been programmed for the LEAP area as statutory requirements under the EC Urban Waste Water Treatment Directive have already been met.

6.7.12 The changes to the four largest LEAP area WWTWs that have resulted from the EC Urban Waste Water Treatment Directive are given in Table 17 below:-

Table 17 - Changes at Major LEAP Area WWTW

WWTW AND CONSENTED DAILY DISCHARGE VOLUME	PREVIOUS TREATMENT	UPGRADING CARRIED OUT / PROPOSED
Barton-on-Sea	Preliminary treatment followed by long sea outfall in the locality of designated bathing waters.	Sewage now pumped to Pennington WWTW with full secondary treatment.
Pennington 32,380m³	Preliminary treatment followed by long sea outfall to designated shellfish waters.	Full secondary treatment unit commissioned March 1997. One option is to extend the sea outfall into the Solent Estuary.
Ashlett Creek 4,727m³	Preliminary treatment followed by discharge to Southampton Water.	Full secondary treatment plant to be commissioned.
Slow Hill Copse Marchwood 14,971m³	Primary screening and maceration followed by discharge to the River Test Estuary.	Extensive secondary treatment unit commissioned in 1982.

Improvements to Ashlett Creek WWTW's required under the Urban Waste Water Treatment Directive should lead to a reduction in coliform levels as well as aesthetic improvements of the foreshore at Calshot recreational beach.

6.7.13 In the LEAP area there are a total of 42 WWTWs. Fourteen are owned by Southern Water Services; the remainder are generally owned by the facility they serve, whether it be a hotel or a business complex. The total consented daily discharge is 58,560m³, of which 95% is from Southern Water Services WWTWs. All Southern Water Services and private WWTWs in the LEAP area are shown on Map 11.

Trade Effluent Consents

6.7.14 In the LEAP area there are only three trade effluent producers consented under the

terms of the Water Resources Act 1991, permitted to discharge more than 5m³/day. The largest of these is Efford Landfill Site which is consented to discharge to the Solent up to 2,736m³/day. Maximum concentrations of 10mg/l of BOD and 2 mg/l ammonia are set within this consent. Map 11 shows all consented discharges greater than 5m³/day.

Consents Issued Under IPC Regulation

6.7.15 IPC (Integrated Pollution Control) monitors and regulates emissions from major industrial processes. This includes all emissions to air, water and soil. The IPC consents issued in the LEAP area are summarised in tabular form below.

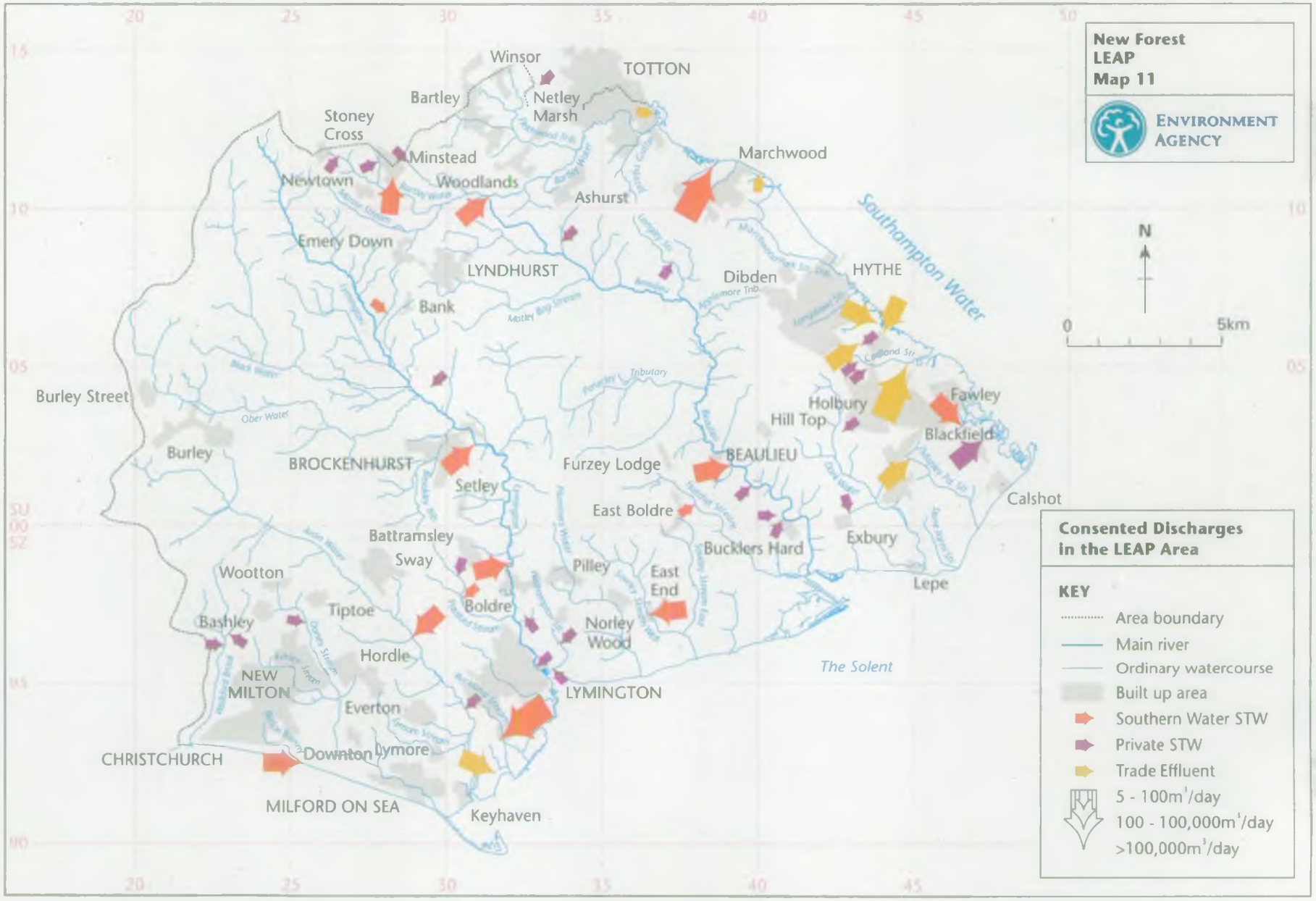
Table 18 - IPC Consents Issued in the LEAP Area

PRODUCER AND LOCATION	EFFLUENT DESCRIPTION AND SOURCE	CONSENTED DISCHARGE VOLUME	RECEIVING WATERS
National Power, Fawley	Saline cooling water	5.6 million m³/day	The Solent
National Power, Fawley	Cooling water and station drainage water. Effluent from station water treatment plant.	80,000m³/day	Power Station Dock
National Power, Fawley	Sea water used for office block air conditioning systems.	2,400m³/day	Power Station Dock
BITMAC Limited, Totton	Process effluent and surface run-off	Not specified	Test Estuary
International Speciality Chemicals Limited	Effluent treatment plant	1,000m³/day	Southampton Water
Rechem International Limited	Trade effluent arising from incineration and chemical treatment processes	700m³/day	Southampton Water
Enichem Elastomers	Process plant effluent	65,000m³/day	Southampton Water
Esso Petroleum	Process (dirty water), cooling water (clean water), ballast water, rain water	543,600m³/day	Southampton Water

6.7.16 The Agency's IPC function sets down discharge consents and limits for substances to be discharged based on the nature of the process involved. In most cases, water is used as a cooling medium in industrial processes. Our IPC function has powers not only to control the quantity of water at the point of discharge, but also within the industrial process.

Reported Pollution Incidents (1996)

6.7.17 In 1996 there were 56 reported pollution incidents on the LEAP area streams. Of these, 24 were unsubstantiated, 28 were categorised as minor incidents, three as significant and one as major. The major incident was an oil spill on the Ober Water for which extensive remedial action was taken to prevent pollution. Two of the significant incidents were oil spills and the other was a chemical spill. The minor incidents were mainly caused by oils and occasionally by farm effluent.


New Forest
LEAP
Map 11
ENVIRONMENT AGENCY
N
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5km
Winsor
TOTTON
Bartley
Netley Marsh
Stoney Cross
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Marchwood
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Southampton Water
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Battramsley
Sway
Bucklers Hard
Exbury
Wootton
Pilley
East End
Lepe
Tiptoe
Boldre
Bashley
Norley Wood
Hordle
The Solent
NEW MILTON
LYMINGTON
Everton
CHRISTCHURCH
Downton
Keyhaven
MILFORD ON SEA
Consented Discharges in the LEAP Area
KEY
Area boundary
Main river
Ordinary watercourse
Built up area
Southern Water STW
Private STW
Trade Effluent
5 - 100m³/day
100 - 100,000m³/day
>100,000m³/day

Effluent Pollution Pressures in the New Forest LEAP Area

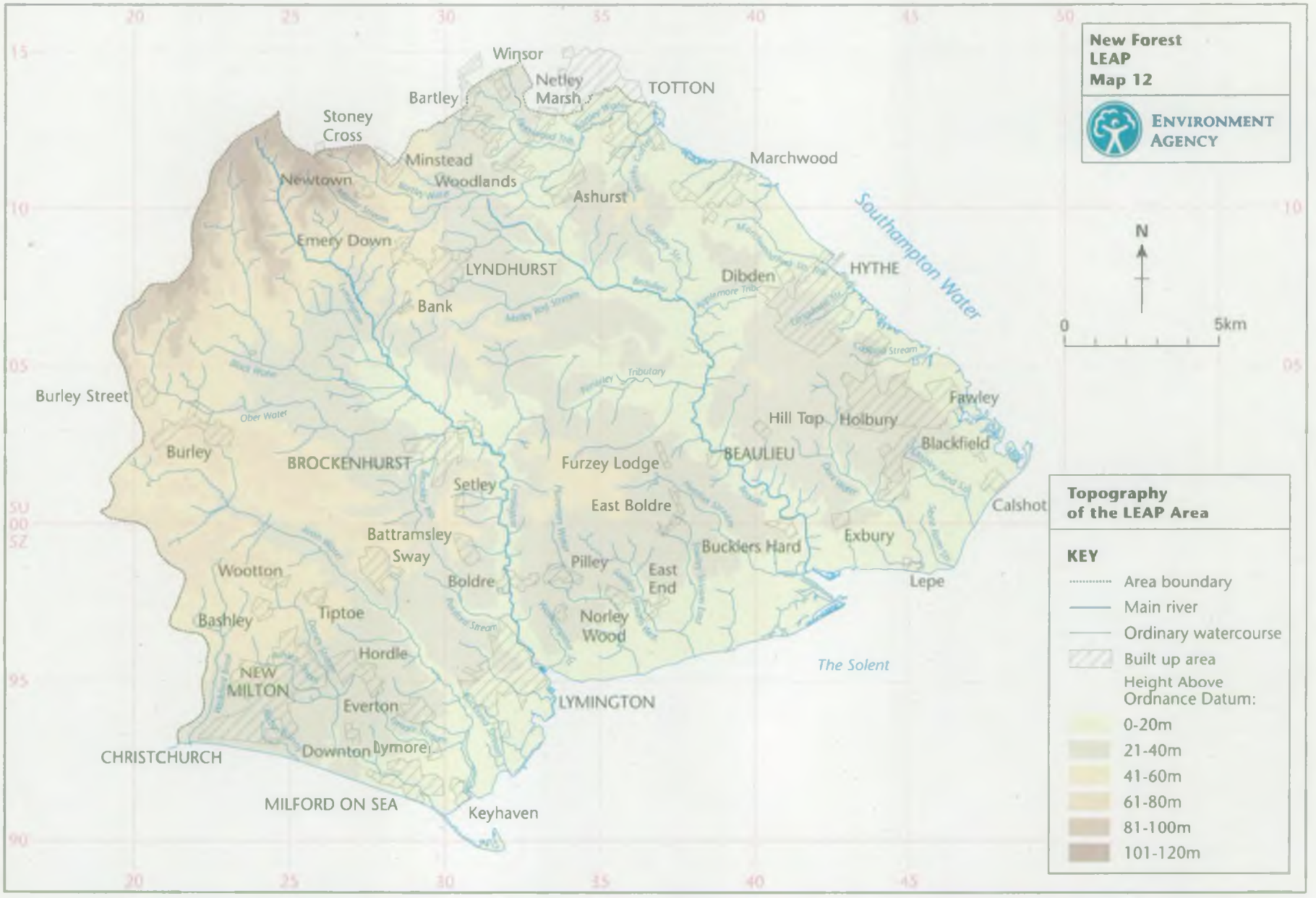
6.7.18 The Agency is concerned about the effect on groundwater quality and movement caused by the gravel extraction and landfilling operations at Manor Farm, Efford, Nr. Lymington. It is believed that the removal of the permeable gravels followed by infilling with relatively impermeable waste has upset the fine equilibrium attained by seawater and freshwater from the gravels with adverse affects on the marshes. Surface water and groundwater that accumulates in the landfill voids is discharged to the marshes which has a strong local impact on the marsh fauna by increasing the relative amount of freshwater. [Issue No. M11].

6.7.19 There have been further problems in the Pennington area with regard to the existing sea outfall. The outfall discharges into a natural shellfish production and holding area and has, due to the high levels of faecal coliform bacteria, made the area prohibited under the EC Shellfish Hygiene Directive. [Issue No. M12]. Accordingly, Southern Water Services have installed a secondary treatment works at Pennington and this became operational in March 1997. One option for further improvement to the discharge is to extend the existing outfall.

6.7.20 The petrochemical complexes at Fawley are closely controlled by IPC. Effluent emission from these processes are closely monitored by Esso and independently by the Agency, but to date there have been no failures of standards. Nonetheless, we are looking to further ensure the minimisation of discharges of dangerous substances from petrochemical processes. To this end, IPC works closely with industry to ensure that the best available technology is utilised to remove dangerous substances from trade effluent. There are however currently no groundwater monitoring boreholes in the vicinity of the Fawley complex and the Agency intends to seek further understanding of the effects of the industrial processes by implementing investigations in this area.

6.7.21 Road and urban drainage discharging can effect the quality of receiving waters. We are actively encouraging ways to handle urban and farm land run-off that are more sensitive and sympathetic to the environment. Rather than managing run-off with concrete channels and culverts that directly feed into the river system and cause rapid overloading, we hope to encourage the creation of water detention and retention features (scrapes and balancing ponds) in conjunction with soakaways, wetland ponds and reed beds that would hold back the delivery of run-off to the Main Rivers; improve the quality of the discharge and create further specialised habitats.

6.7.22 With respect to the management and control of water quality arising from run-off from agricultural land, we are encouraging, at a national level, best land management practices. One method of reducing inputs into a watercourse is the use of buffer strips (an uncultivated piece of land adjacent to streams and ditches). The Agency will promote agri-environmental schemes.


New Forest
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Map 12
Environment Agency
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NEW MILTON
LYMINGTON
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Downton
Lymore
CHRISTCHURCH
MILFORD ON SEA
Keyhaven
Topography of the LEAP Area
KEY
Area boundary
Main river
Ordinary watercourse
Built up area
Height Above Ordnance Datum:
0-20m
21-40m
41-60m
61-80m
81-100m
101-120m

Nature Conservation Impacts

Crown Lands of the New Forest

6.7.23 The naturally nutrient-poor status of the New Forest streams with their low summer flow rates means that these watercourses are generally unsuitable as receiving waters for waste water discharges, particularly during the summer months when flows are low. [Issue No. M8].

6.7.24 Eutrophication of water courses above the naturally very poor levels of nutrients found in the New Forest water course has implications for the near pristine and specialist aquatic communities that are native to the area. Of particular conservation concern is the stretch of the Lymington River below Brockenhurst, which receives treated sewage waste which can represent well over 50% of the total flow during the summer, and the discharge of the Lyndhurst WWTW into the Bartley Water.

Coastal Zone

6.7.25 Other waste water outfalls discharge into the intertidal zone at Pennington, Lymington and Ashlett. The Pennington works has recently been re-constructed to improve treatment standards. However, the additional treatment is not expected to raise shellfish quality to the level which would allow removal of the present prohibition Order. Improvements have also been programmed for Ashlett Creek WWTW.

6.7.26 The coastal waters into which these discharges occur are classified by the Department of the Environment as estuarine. They are relatively shallow and sensitive to pollution loads. The classification influences the levels of nutrients and coliform bacteria permissible in the discharges, and thus the level of treatment required at the WWTW.

6.7.27 Excessive nitrate or phosphate loads may assist the invertebrate and fish productivity of inshore waters and thus also to the support of wading birds and wildfowl. However, gains in productivity are usually made at the expense of biodiversity. Parts of the intertidal and subtidal areas have been designated as Special Area of Conservation, and the Agency is required to contribute to maintaining them at a favourable conservation status. However, objectives for the management of these waters have not yet been agreed with English Nature.

6.8 Protection From Flooding

Overview

6.8.1 A key aim of the Environment Agency is to provide appropriate protection for people and property against flooding from rivers and the sea and to provide adequate arrangements for flood forecasting and warning.

The Nature of Flooding - River Flooding

6.8.2 The river network carries surplus water from land to the sea as part of the natural water cycle. Rivers and watercourses can only cope with a certain maximum flow and when this is exceeded flooding occurs. This is a natural process in which rivers and their floodplains evolve as an integral system. Flooding can be caused by prolonged rainfall, thunderstorms or rapid snowmelt. The peak flow of a flood is measured and expressed in terms of the frequency at which that flow is statistically likely to recur, for example 1 in 10 years or 10% chance in any one year. Seemingly similar types of watercourse will respond differently to the same rainfall conditions due to variations in catchment areas and land use. For example, an urbanised catchment with a high proportion of paved surfaces and drains, will have rivers whose levels respond relatively quickly to rainfall. The more open countryside of a rural catchment will often allow more of the rain to soak into the ground and thus slow down run-off, so river levels will rise less rapidly but remain at the higher level longer.

6.8.3 The New Forest rivers are fed by numerous smaller tributaries and are ultimately responsible for draining the area. Map 12 shows the topography of the catchment. These smaller tributaries principally rise in the northern parts of the New Forest LEAP area which comprise steep forested areas, overlain by Tertiary strata. This topography can result in a 'flashy' run-off within certain tributaries. The effects of meandering and the small freeboard cause large areas of the upper reaches to flood during winter, which produces an attenuating effect on the peak run-offs and is responsible for the rich and varied nature of the conservation interest of the New Forest.

6.8.4 Historically, mires and watercourse channels within the upland areas of the New Forest have been regraded and drained to increase land drainage efficiency (see later in this section). Although such actions are today strongly opposed by conservation interests, they have consequently resulted in the exposure of the lower reaches of the arterial rivers to flood risk. [Issue Nos. M3 and M4]. Conservation interests are presently now seeking the re-establishment of natural river topographies. Whilst primarily promoting the redevelopment of upland wetlands, the Agency recognises that such actions could help alleviate pressures within the arterial river.

6.8.5 Localised flooding may also occur where watercourses become blocked at particular points such as under bridges or in culverts by garden waste or other rubbish which has been deposited on river banks. Flooding can also occur where surface water drains are unable to discharge into swollen watercourses, or further back in the drainage system where capacity is exceeded. An atypical situation, common to the New Forest, is the development of debris dams. These are created at arbitrary locations by waterborne forest litter, resulting in localised flooding at times of peak run-off. Flooding associated with debris dams generally occurs within the Forest. These structures are transient in that they are sooner or later breached by flood water, and swept clear. Once swept clear, the main concern is the potential blockage of downstream structures, resulting in flooding of urban areas. The Forestry Commission presently manages these structures on a systematic basis but without reference to the Agency. However, their value with respect to affecting flooding within the arterial river and the creation of temporary wetland habitats is now becoming recognised. [Issue No. M9].

6.8.6 When watercourses flood, water flows into the natural floodplain providing extra capacity for the storage and passing downstream of flood water. Capacity is reduced if significant areas of floodplain have been raised, embanked, or built upon. This loss of storage volume can lead to higher river levels elsewhere and for this reason it is not possible (or desirable) to alleviate flooding in all areas. The priority for flood alleviation lies in urban areas, and undeveloped floodplains should be allowed to play their natural role, as the continuity between the river and its floodplain is an essential part of the water cycle. Indeed, with hindsight, flooding episodes recently experienced within the centre of Milford-on-Sea (consequently resulting in the development of a flood relief scheme) may be attributable to the upstream development of the town of New Milton within the catchment. In early 1997 the Agency issued a document entitled 'Policy and Practice for the Protection of Floodplains' which sets out our objectives with respect to promoting sustainable development upon floodplains. The principal areas at risk from fluvial flooding are reported and discussed later.

The Nature of Flooding - Coastal Flooding

6.8.7 Flooding may also occur when meteorological conditions such as low atmospheric pressure, wind speed and direction combine with topography, producing tide levels (known as surge tides) which may be greater than the sea defence levels. In estuaries a combination of freshwater river flows and tidal surges can also cause flooding. Southern England is presently sinking on a geological timescale under tectonic influences, resulting in an effective rise in sea level. Sea levels are also rising as a result of global warming. This geological action, in conjunction with global warming may expose coastal zones to increased risk of flooding. [Issue No. M15].

6.8.8 Extensive areas of the New Forest LEAP coastal zone between the Dorset border and Calshot are below high tide level. Subsequently, sea defences of varying design, ownership and responsibility have been constructed around this coast. Sea defences (i.e. those constructed to protect properties against flooding) and coastal protection works (i.e. those constructed to protect properties against coastal erosion) are operated and maintained by the Agency, local authorities and/or private landowners. Information upon the size, type and nature of these defences is presently held on Agency files (see Map 13). The principal areas at risk from tidal/coastal flooding are reported and discussed later.


New Forest
LEAP
Map 13
Environment Agency
Flood Defence Section 24 Map of the LEAP Area
KEY
Area boundary
Main river
Ordinary watercourse
Built up area
Weir
Tidal Flap
Sea/River Wall
Sluice
Water Level Recorder
Telemetering Raingauge
Permanent Gauging Station
Flood Plain
Winsor
Netley Marsh
TOTTON
Bartley
Stoney Cross
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Norley Wood
The Solent
NEW MILTON
Hordle
Everton
LYMINGTON
Lymore
Downton
CHRISTCHURCH
MILFORD ON SEA
Keyhaven
N
0
5km

Regulation

Main River and Ordinary Watercourse

6.8.9 All watercourses are classified as either 'Main River' or 'ordinary watercourses' (sometimes referred to as 'non-Main River'). Whilst the Agency is responsible for administering all flood defence matters, we also have specific and special powers to enable us to carry out or control works on or affecting Main Rivers and sea defences. The drainage authorities (county and district authorities) have powers for flood defence on ordinary watercourses and also for protecting the coast from erosion by the sea. Proposed revisions to Main River are dealt with through a consultation and advertising process with the final decision whether to 'enmain' a river, or not, being made by MAFF. New Forest District Council is actively promoting the 'enmainment' of the Marchwood Streams (an ordinary watercourse system comprising three separate streams) within the New Forest LEAP area such as to transfer its responsibility for management and maintenance to the Agency.

Planning

6.8.10 Historically, urban development upon floodplains has effected flows in rivers necessitating the need for river defences; these have subsequently suffered from over-topping as a result of further urban expansion. The majority of historic urban developments within this catchment have now subsequently been protected to some extent against tidal and river flood risk. In some instances the standard of protection offered has been compromised by further urban development.

6.8.11 Following the publication of DoE guidance in 1992 (Government Circular 30/92 'Development and Flood Risk'), the Agency, as advisors to planning authorities, now aims to provide appropriate advice and recommendations upon all new development where risk of flooding may be a concern, and that existing development is not adversely affected by increased run-off from new development. The Agency's Planning Liaison Section negotiates with developers, on behalf of the Planning Authority, to ensure that all necessary infrastructure works are provided as part of any developments and to protect the development and third parties against flood risk to an agreed standard, whilst also safeguarding the ability of the watercourse to carry flood water and conserving it as an ecological corridor. These aims are being achieved with the provision of set back development and riverside enhancement works for the benefit of the general public where appropriate.

6.8.12 Section 105 of the Water Resources Act 1991 requires the Agency to exercise a general supervision over all flood defence matters. Section 105 (2) of this Act requires us to survey the catchment areas in which we carry out our flood defence function. These surveys are our main contribution to local development patterns. Amongst other things, the survey should indicate areas where flooding problems are likely. In particular, it will help to identify the extent of the floodplains, washlands and other land liable to flood, in relation to risk; along some coastlines they may identify set-back lines beyond

which most development should be avoided. Surveys are prepared using aerial photography techniques. We commenced this process for the New Forest catchment in November 1997 and the coastal fringes and lower reaches of the Beaulieu and Lymington Rivers (an area comprising some 83km²) have been surveyed to date. The remaining areas comprising the upper reaches of the Beaulieu, Lymington and Avon and the Danes Stream are scheduled to be surveyed in 1998/99. It is expected to take 3 - 5 years to publish the final Section 105 maps for this area.

6.8.13 The Section 105 maps will form an integral part of our Flood Defence Management System documentation. This document will ultimately identify, examine and redefine all areas considered vulnerable to flooding. Although this document will not be formally published for several years [Issue No. M14], we will continue to base our assessments upon information presently available to our officers, namely the Section 24 maps, unless salient information pertaining to the Section 105 maps becomes more applicable. Based upon our present knowledge, the river and coastal areas which have been identified as being vulnerable to flooding are as shown in Tables 19 and 20 below.

Table 19 - Principal Areas at Risk from River Flooding

Watercourse	Location
Danes Stream	**High Street and Ashley Lane, Milford-on-Sea**
Avon Water	**Vidle Van Farm, Keyhaven**
Lymington River	**Undershore Road, Lymington** **Properties at The Weir, Brockenhurst**
Beaulieu River	**Properties in Beaulieu Village**
Bartley Water	**Roads and properties in Bartley Village** **Roads in Netley Marsh Village** **Woodlands Road, Ashurst**

Table 20 - Principal Areas at Risk from Coastal Flooding (including Tidal Flooding)

Catchment Area	Location
Danes Stream	Properties adjacent to Hurst Spit defence
Thorns Stream	Thorns Marsh
Hatchet Water	Park Shore
Dark Water	Land behind coast road
Hythe Streams	Roads and properties in Hythe
Bartley Water	Magazine Lane and Cracknore Hard, Marchwood Industrial premises in Totton Rumbridge Street and Brokenford Lane, Totton Properties in Eling

Land Drainage Consents

Land Drainage Consents

6.8.14 Responsibility for all flood defence matters rests with the Agency. In order to carry out our role successfully, it is essential that anyone who intends carrying out works in, over, under or within 8m of a Main River watercourse obtains our consent **before** starting work, to ensure that any works do not endanger life or damage property by increasing risk of flooding. To assist applicants in submitting a valid application for consent, we provide a full set of guidance notes and technical information sheets to cover the most common topics such as bridges and outfalls.

6.8.15 Access along river banks for staff and equipment needs to be preserved wherever possible, especially for emergency works. To ensure this access is kept clear the Agency generally does not grant a consent to any development within 8m of a Main River watercourse which would compromise flood defence work activities. In deciding whether to issue a consent the Agency will also take into account whether the proposed works conserve and enhance the environment and biodiversity.

Surface Water Control

6.8.16 Surface water run-off is likely to be increased to some degree as a result of development as more impermeable surfaces such as roofs and pavements are created. The impacts of such development, however small, add up and can lead to significant problems in due course. Increases in both the amount and rate of water reaching rivers can, if not managed, lead to greater risk of flooding. We will seek to ensure new development is carefully located and designed. Where appropriate, we will require measures to control surface water to be incorporated into the overall development.

Water Level Management Plans

6.8.17 Recent guidance has been issued by the Government on the preparation of Water Level Management Plans (WLMPs) for Sites of Special Scientific Interest or other areas of high ecological or landscape importance. Where the Agency is the operating authority, we will liaise with English Nature, landowners and others to prepare a plan to ensure appropriate key water levels are safeguarded.

6.8.18 Within this catchment a WLMP has already been prepared for the Lymington River Outfall. This plan covers the lower reaches of the Lymington River between the Lymington Toll Bridge and Shallow Lane and comprises around 65 acres of reed beds. This is one of the major reed bed sites in southern England and has been designated a Site of Special Scientific Interest (SSSI), although currently there is some concern that increased water levels in the reed bed are reducing the nature conservation value of the area. [Issue No. S5]. This WLMP forms a written agreement between ourselves, Hampshire Wildlife Trust and English Nature. It cites those parties with an interest in the area, sets out the objectives of these parties and outlines procedures for monitoring. We are presently gathering data with a view to preparing WLMPs for the Pennington and Keyhaven Marshes. This work is likely to be completed during 1998/99.

Operations

Structures

6.8.19 River control structures generally control water levels upstream, but can usually be adjusted to allow surplus water to pass downstream. Sea and tidal defence structures typically protect land and properties from inundation by high tides. Owing to the fact that extensive areas of the New Forest coastal zone lie below high tide level, a significant proportion of structures constructed to date are directly associated with sea and tidal defence.

6.8.20 The Agency and its predecessor organisations have constructed a significant number of sea gates, tidal flaps, river weirs, flood banks and other such structures across the New Forest catchment area to both regulate river flow and prevent tidal and coastal flooding. The principal structures which are owned and maintained by the Agency are shown in Table 21 below:

Table 21 - Principal Flood Defence Structures
Agency Owned and Maintained

Watercourse Catchment Area	Structure Type and Location
Danes Stream	Stop Boards - Start Road Piled Wall - Milford-on-Sea
Lymington to Keyhaven Sea Defences	Sea Wall - Keyhaven to Lymington Tidal Flaps - Keyhaven Tidal Sluice - Lymington 'Toll Bridge' Moses Dock Door Maiden Flap - The Salterns Pennington Lake Stream Outfalls Flood Gates - Saltgrass Lane, Keyhaven Flood Gates - Yacht Club, Keyhaven Flood Gates - Lymington Town
Dark Water	Tidal Flap - Lepe
Hythe Streams	Twin High Tide Flaps - Hythe Marina
Bartley Water	Tidal Bank and Flood Walls - Rumbridge

6.8.21 Privately owned structures (i.e. those not owned and maintained by the Agency) are common on watercourses, for a variety of traditional water uses, such as operation of mills, creation of navigation channels and fish farming and amenity. Such structures may be owned by local and district authorities, private companies or private individuals. By law these must be maintained and operated properly by their owners if they affect river levels and flows. Within the New Forest catchment area, structures safeguarding against tidal and coastal flooding are also in the hands of private

ownership. The condition of privately owned structures can be of concern. [Issue No. S7]. The principal structures which are privately owned and maintained are shown in Table 22 below:-

Table 22 - Principal Flood Defence Structures Privately Owned and Maintained

Catchment Area	Structure Type and Location
Danes Stream	Natural shingle bank - Hurst Spit Fixed Weir - Ashley Bridge
Avon Water	Surface water pumping station - Keyhaven Overspill Weir - Efford Mill Overspill Weir - Gordleton Mill
Lymington River	Fixed Weir - Brockenhurst Mill
Thorns Stream	Embankment and Groyne System
Hatchet Water	Embankment and Groyne System
Beaulieu River	Five electric sluice gates - Beaulieu Village Sluice gates - Mill House, Beaulieu Tidal defences - Mouth of Estuary
Dark Water	Natural raised bank and road
Fawley	Sea defences - oil refinery
Bartley Water	Tidal Mill, twin overspill weirs and twin outlets - Eling Causeway.
Walkford Brook	Culvert - Highcliffe
Crookford Stream	Sea defences
Hythe Stream	Sea defences - Hythe Pier Surface water pumping station - Hythe Hard

Routine Maintenance Regime

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

6.8.23 The Agency has permissive powers, on Main Rivers, to undertake works and exercise powers in this respect according to available resources and priorities. Regular maintenance is essential if the river system and sea defences are to operate properly at times of high water levels. Such maintenance works include vegetation control, repairs to earth embankments and other floodwalls, obstruction and blockage removal and dredging. Appropriate maintenance can contribute significantly to reducing the risk of flooding.

6.8.24 In this catchment an annual allocation (1997/98) in the region of £46,000 has been made for routine maintenance works to Main Rivers, with an additional contingency for unplanned urgent works being in the region of £5,000. This figure is reviewed annually with funding set in the context of the principal works envisaged. At times of heavy rainfall, our operational priorities are to check and operate water level control structures and clear debris and identified obstructions where possible.

Emergency Response

6.8.25 At times of high water levels, in addition to our flood warning role, the Agency patrols the defences, operates flood defence structures, removes blockages and carries out any emergency repairs needed. The Local Authority also has permissive powers to offer assistance during floods including placing sandbags, moving possessions and evacuating people. The fire and rescue service provides help in flood emergencies if they are able to do so. The local station will be able to advise the public on what help is, or is likely to be, available and whether or not a charge will be made.

6.8.26 The County Council is responsible for public highways and deals with any flooding problems associated with road drainage. All County Councils have Emergency Planning Officers who may become involved in more serious flood events. Public surface water sewerage systems are the responsibility of the local water company, who may sometimes use District Councils as their agents.

Improvements

Capital Works

6.8.27 In addition to general maintenance work, the Agency may build new flood defences if flooding is a serious problem in a particular area. Nowadays we usually only build new defences to protect built-up areas from flooding. All schemes must be technically, economically and environmentally sound. We keep a list of schemes called a Programme of Capital Works which helps us to plan for the future.

6.8.28 During 1996/97 capital expenditure was primarily aimed at completing the improvements to the tidal defences at Lymington and at the reconstruction of the Ashley Lane culvert at New Milton. The completion of the road raising works at Undershore Road on the east bank of the Lymington River cost approximately £195,000 to implement and marked the end of a comprehensive scheme to improve the defences which protect Lymington from tidal flooding. The works were begun in the early 1990s in response to the severe flooding experienced in the town in December 1989 when some 100 residential properties were inundated to depths of up to 1.2m. The defences now provide protection against a tidal event which might occur, on average, once in 250 years. The overall scheme cost approximately £7,500,000 to implement. The reconstruction of the Ashley Lane culvert at New Milton was completed in August 1996 at a cost of £57,000.

6.8.29 During 1997/98, capital expenditure will almost exclusively be targeted at the construction of a flood alleviation facility which will alleviate the recurrent flooding experienced at Milford-on-Sea. The scheme has been designed to provide a general minimum standard of 1 in 100 years. Once in 15 years, the B3058 at Taddiford Gap could be expected to be subject to flooding due to the operation of the scheme, resulting in temporary road closure. The flood retention embankment will be constructed approximately 4.5m high largely from materials excavated from a site immediately adjacent to the embankment, and will be grassed. Flow control will be achieved by

means of an automatically operated floodgate, within the centre of the embankment. This system will be monitored by the Agency (see Map 14). Planning permission for the scheme has been granted and construction commenced in the autumn of 1997. Our estimates put the construction costs of this scheme at around £650,000.

Shoreline Management Plans (SMPs)

6.8.30 A Shoreline Management Plan is a non-statutory document which sets out a strategy for coastal defence for a specified length of coast, taking account of natural coastal processes and human and other environmental influences and needs. Recent research has suggested that the coastline of England and Wales can be divided into 11 major sediment cells. A sediment cell is defined as a length of coastline which is relatively self-contained as far as the movement of sand and shingle is concerned and where interruption to such movement should not have a significant effect on adjacent sediment cells.

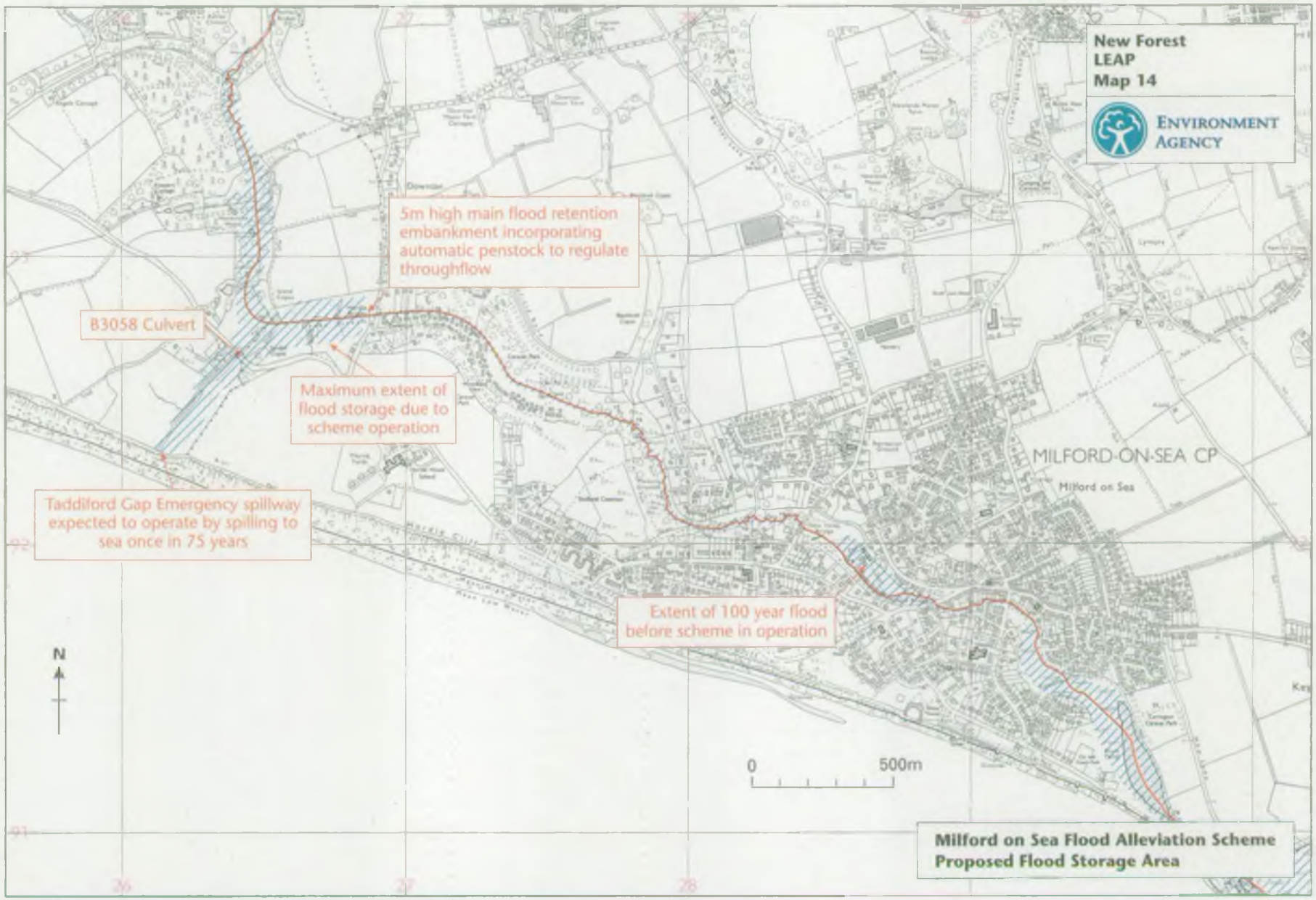
6.8.31 SMPs provide the vehicle for the long-term sustainable protection of our coastlines and their objectives are to:-

- improve our understanding of coastal processes;
- work in partnership with all interests and organisations;
- prepare an agreed framework for the long-term planning of coastal defences.

6.8.32 The Western Solent and Southampton Water SMP was completed in a draft form for consultation in March 1997. The report assesses the current condition of all sea defence structures, their likely period of survival and the options for future defence strategies. The LEAP area coastline is subdivided into four coastal process units each of which is subdivided into a number of management units for detailed analysis of defence structures. There are a total of 34 management units along the LEAP coastline. For each management unit the draft SMP reviews the likely consequences of each of the following options in respect of existing sea defences:-

i) Do nothing
ii) Hold the existing defence line
iii) Advance the existing defence line
iv) Retreat the existing defence line

The SMP then makes recommendations for an appropriate strategy for each management unit.



6.8.33 The principal sea defence strategy defined by the draft SMP for each management unit in the LEAP area is set out in Table 23 below:-

Table 23 - Shoreline Management Plan - Process Unit Statement Summary

Unit No	Unit Name	Proposed Strategy	Comments
BAR1	Chewton Bunny to Island View Road, Barton	Retreat the existing defence line.	Reduced rate of cliff toe erosion and associated risk to property and access road to Naish Farm Holiday Village.
BAR2	Island View Road to Barton Golf Course	Hold the existing defence line.	Protection of cliff top property at Barton on Sea. Preservation of archaeological site.
BAR3	Barton Golf Course to Hordle Cliff	Do nothing.	Loss of agricultural land and potential risk to Barton Golf Course. No mention of risk to golf course.
BAR4	Hordle Cliff to end of HurstRoad	Hold the existing defence line.	Protection of residential conurbation at Milford on Sea.
BAR5	Hurst Road to Hurst Spit	Hold the existing defence line.	Prevention of flooding and lyingagriculturalhinterland Protection of semi-natural coastal habitat designated as SINC5.
BAR6	Hurst Beach	Hold the existing defence line.	Protection of lighthouse and other buildings on spit. Protection of Hurst Castle and other ancient monuments. Protection of internationally significant nature conservation site in marshland.
LYM1	Hurst Castle to Hurst Spit North Point	Do nothing (assuming adoption of 'hold the existing defence line' in BAR6).	Potential sediment encroachment into navigation channel off North Point.
LYM2		Do nothing (assuming adoption of 'hold the existing defence line' in BAR6).	Maintain high landscape quality of natural coast.
LYM3	Saltgrass Lane to Lymington Yacht Haven	Hold the existing defence line.	Protection of inland conservation areas.
LYM4	Lymington River	Hold the existing defence line.	Continued protection of existing intensely developed frontage of Lymington.
LYM5	Elmers Court Country Club to Pitts Deep	Managed retreat.	Increase in intertidal area. Reduction in flood threat towards LYM4.
LYM6	Pitts Deep to Warren Beach Cottage	Managed retreat.	Loss of some agricultural land and private property. Reduced loss of shingle beach which is of international nature conservation significance.
LYM7	Warren Farm Spit	Do nothing.	Potential impact on navigation channel at mouth of Beaulieu River. Potential short term increase in intertidal habitats. Maintenance of spit through sediment feed from LYM6.
LYM8	Beaulieu River	Do nothing.	Increased frequency and levels of flooding with loss of some Grade 4 agricultural land. Maintain area of intertidal habitats on mudflats.
LYM9	Inchmery to Lepe	Hold the existing defence line.	Hold the existing defence line = Protection of existing cliff top properties.

LYM10	Lepe to East of Stone Point	Hold the existing defence line.	Protection of Lepe Country Park. Maintain inland SAC, NNR, SSSI, SPA/Ramsar
LYM11	East of Stone Point to South of Bourne Gap	Do nothing.	Loss of undeveloped wooded area. Maintain internationally valuable intertidal area (NNR).
LYM12	South of Bourne Gap to Hillhead	Retreat the existing defence line.	Reduced loss of cliff top land properties at Eaglehurst and Hillhead not affected. Potential increase in area of intertidal habitats.
LYM13	Hillhead to Calshot Spit	Hold the existing defence line.	Protection of car park at Calshot Spit. Protection of Grade 4 agricultural land. Also critical to protection of power station and oil refinery facilities.
LYM14	Calshot Spit	Hold the existing defence line.	Protection of Calshot Castle and Activity Centre.
FAW1	Lee side of Calshot Spit.	Hold the existing defence line.	Loss of developed land near Activity Centre. Short-term increase in intertidal habitats.
FAW2	Calshot Spit to Fawley Power Station	Hold the existing defence line.	Protection of reclaimed Grade 4 agricultural land.
FAW3	Fawley Power Station	Hold the existing defence line.	Protection of Power Station from flooding.
FAW4	Fawley Power Station to Fawley Oil Refinery	Hold the existing defence line.	Protection of residential areas of Fawley with conservation area status. Protection of inland SINC25.
FAW5	Fawley Oil Refinery	Hold the existing defence line.	Protection of Oil Refinery.
FAW6	Fawley Oil Refinery to Hythe Sailing Club	Retreat the existing defence line.	Loss of Hythe Sailing Club property and part of railway line.
FAW7	Hythe Sailing Club to Hythe Marina	Hold the existing defence line.	Protection of developed frontages of Hythe. Preservation of conservation areas.
TEST1	Hythe Marina to Marchwood Military Port	Hold the existing defence line.	Protection of developed frontages and reclaimed land against flooding.
TEST2	archwood Military Port	Hold the existing defence line.	Protection of low-lying Marchwood Military Port from flooding.
TEST3	Marchwood Military Port to Magazine Hard, North	Hold the existing defence line.	Protection of Military Port from flooding. Preservation of archaeological site.
TEST4	Magazine Hard, North to Eling Creek	Do nothing.	Erosion of undeveloped coastal land. Long term loss of some Grade 4-5 agricultural land and recreational or undeveloped land. Landward expansion of intertidal habitats.
TEST5	Eling Creek to Redbridge	Hold the existing defence line.	

Flood Warning

Flood Warning Responsibilities

6.8.34 We recognise that, irrespective of attempts to minimise the risk from flooding through the implementation of various policies and actions, flooding can occur and on occasion represents a risk to human life. With regard to public safety, a flood forecasting service is provided in the catchment which uses rain gauge and river level data from a number of sites, radar and rainfall forecast data from meteorological agencies, and information from flood defence staff in the field.

Flood Warning Dissemination

6.8.35 Flood warnings are colour coded. The colour denoting the possible severity of the flood. As well as issuing flood warnings, we have the lead role in making sure that they actually get through to the people at risk. Arrangements are agreed in consultation with local authorities and the emergency services. Annual flood warning seminars are also held to review the effectiveness of the flood forecasting and warning process.

6.8.36 Details of the local flood warning system are presented in Table 24 below:-

Table 24 - Definition of Colour-Coded Warning

COLOUR CODE	GENERAL POSSIBILITIES OF FLOODING
Yellow	A warning of flooding to some low-lying farm land and roads near rivers on the sea.
Amber	A warning of flooding to isolated properties, roads and large areas of farm land near rivers or the sea.
Red	A warning of serious flooding affecting many properties, roads and large areas of farm land.

River Flood Warning Dissemination Service

6.8.37 The extent to which flood warnings will be issued is dependent upon the estimation of the phase reached in the Environment Agency's colour-coded system. This will be evaluated by the Environment Agency staff who will monitor rain gauges, catchment conditions, river flows and Meteorological Office forecasts.

6.8.38 The organisations and people to be contacted and the methods of dissemination for the three phases of warning are identified in Table 25. At present this service covers only the upper and lower reaches of the Lymington River and Danes Stream.

Table 25 - New Forest River Flood Warning Dissemination Plan

COLOUR CODE	CONTACTS	ZONES AND METHODS OF CONTACT		
		1. Lymington River above Brockenhurst, including the Weir	2. Lymington River below Brockenhurst	3. Danes Stream
Yellow	Hampshire Police, Fire & Rescue Ambulance Services	Fax	Fax	Fax
	New Forest District Council	Fax	Fax	Fax
	Hampshire County Council	Fax	Fax	Fax
Amber	Hampshire Police, Fire & Rescue Ambulance Services	Fax	Fax	Fax
	New Forest District Council	Fax	Fax	Fax
	Hampshire County Council	Fax	Fax	Fax
	General Public	see below	see below	see below
Red	Hampshire Police, Fire & Rescue Ambulance Services	Fax	Fax	Fax
	New Forest District Council	Fax	Fax	Fax
	Hampshire County Council	Fax	Fax	Fax
	General Public	see below	see below	see below

6.8.39 Methods of contacting the general public will include some or all of the following:-

Automatic voice messaging
Local BBC and commercial radio stations
TV (BBC South and Meridian)
Teletext : Page 105
Meteorological Office forecasts
Floodcall information line
Floodwatch - Flood warden schemes

Coastal Flood Warning Dissemination Services

6.8.40 Tidal surge warnings will be issued. The Southern Region of the Environment Agency receives tidal warnings from the Meteorological Office, will monitor tidal gauges around the south coast and formulate tidal predictions based on this monitoring, the astronomical tide level, sea state, wind speed and direction. Since this is a Tidal Warning Service, up to 36 hours notice may be given of a surge condition. The organisations and people to be contacted and the methods of dissemination for the three phases of warning are identified in Table 26.

Table 26 - New Forest Coastal Flood Warning Dissemination Plan

COLOUR CODE	CONTACTS	ZONES AND METHODS OF CONTACT	
		1. Dorset border to Culshot	2. Southampton Water
Yellow	Hampshire Police, Fire & Rescue	Fax	Fax
	Ambulance Services		
	New Forest District Council	Fax	Fax
	Southampton City Council	-	Fax
	Hampshire County Council	Fax	Fax
	HM Coastguard		
Amber	Hampshire Police, Fire & Rescue	Fax	Fax
	Ambulance Services		
	New Forest District Council	Fax	Fax
	Southampton City Council	-	Fax
	Hampshire County Council	Fax	Fax
	General Public	see below	see below
	HM Coastguard		
Red	Hampshire Police, Fire & Rescue	Fax	Fax
	Ambulance Services		
	New Forest District Council	Fax	Fax
	Southampton City Council	-	Fax
	Hampshire County Council	Fax	Fax
	General Public	see below	see below
	HM Coastguard		

6.8.41 Methods of contacting the general public in coastal locations may include some or all of options outlined previously.

Nature Conservation Impacts

Crown Lands of the New Forest

6.8.42 The low freeboard of many of the upper reaches of the New Forest streams has meant that the valley floors of the Crown Lands are subject to flooding during the winter months, a process that is essential to the ecology of the Forest as a whole. In addition, the impermeable nature of the geology of the Crown Lands also means that the upper catchments are substantially water-logged; with the water table close to the surface year round. This results in the characteristic mires of the Forest.

6.8.43 In past decades, both these Forest characteristics have been seen as undesirable, for the following reasons:

- local waterlogging reduces the productive potential of managed forest, and;
- the Commoners considered that valley mires pose a risk to livestock, and that local flooding reduces the grazing potential of grasslands for their stock.

6.8.44 Through pressure from the Commoners, the Forestry Commission has initiated the digging of numerous drains and ditches throughout the New Forest wetlands, including areas of flood plain grasslands, naturally flooding riverine woodlands, wet heaths and mires. This has led to significant change in the vegetation communities dependent on the inherent wetness of the New Forest to the detriment of their ecological interest, with perhaps the greatest impact on the valley mires.

Impact of Drainage Efforts on the Conservation Interest of Valley Mires

6.8.45 The zonation of the vegetation types associated with valley mires and their resultant species diversity is dependent upon the hydrological regime of the individual mire and associated hydrological gradients. Disruption to this regime through drainage alters this zonation with the loss of community types and therefore species diversity. [Issue No. M3]..

6.8.46 The detrimental effects of mire drainage on New Forest ecology is now generally accepted to be undesirable; the Commoners themselves increasingly appreciate the importance of mires as the most productive grazing areas during times of drought, as have been experienced in recent years, and the Forestry Commission have become increasingly aware of the ecological implications of drainage programmes. This has resulted in a significant programme of mire restoration, predominantly funded by the Forestry Commission, and for which a Subject Plan has been agreed with English Nature. Additional mires exist outside of the Crown Land which also require restorative efforts.

Impact of Drainage Efforts on the Natural Morphology of New Forest Streams

6.8.47 Many of the New Forest rivers, and particularly those on the western side of the Forest, have been modified by engineering, again for reasons of drainage. These works, undertaken for a number of reasons since the late 1870s, have divorced the streams from the floodplains and resulted in the deepening and straightening of streams, leaving wide spoil mounds along their banks and disrupting natural flood plain processes. This has caused the following problems which the Agency must consider in addressing drainage:-

- lowering of bed levels
- headward erosion of streams into mires
- down cutting of streams
- reduction in the complexity of stream morphology
- loss of stream habitat diversity
- drainage of flood plain wetlands
- discontinuity between watercourses and floodplain habitats

6.8.48 The impact of these processes is profound, affecting not only the natural stream function, but also drainage patterns of the surrounding land, with effects on local hydrological regimes. This in turn affects the valley mires, wet heath, riparian alder woodland (a Habitats Directive Priority Habitat) and other plant communities of the Forest.

6.8.49 Valley mires are particularly affected, suffering direct loss through the creation of nick points resulting from the lowering of stream bed levels. These nick points erode headwards into the mire, leading to a loss of peat soils, lowering of the water table and increased drainage of the mire.. [Issue No. M3].

6.8.50 As a result of the growing recognition and acceptance of these impacts, there is now a movement towards the restoration of natural stream profiles through back filling with spoil and channel habitat enhancement schemes, the installation of flights of weirs and the retention of some debris dams which can be part of a natural process.

Impact of Drainage Efforts on the Conservation Interest of Debris Dams

6.8.51 Historically, debris dams have been seen as impounding flood waters, resulting in local flooding events and decreasing drainage efficiency. This has led to a general policy of clearance in the Forest by the Forestry Commission, with negative implications for natural stream processes, specialised invertebrate fauna and adjacent habitats.

6.8.52 Pressure for the clearance of debris dams has also come from Commoners, and particularly where their presence has resulted in the flooding of grassland. This has been perceived by the Commoners to be highly damaging to the grazing, although recent work suggests that it is the regularly flooded lawns which are, in fact, the most productive.

6.8.53 Debris dams are also cleared in an attempt to 'tidy' the Forest and improve fish passage. Grading of dams on a scale of 1 - 5 as agreed by the Forestry Commission in the past with interested parties seems to be a workable approach. The worst blockages (4 and 5) would be removed as they present a serious flood risk or prevent the upstream migration of fish. The effect on the downstream movement of kelts, smolts and other fish species is unclear.

6.8.54 Wherever pressure exists to remove a dam, conflicts with issues of nature conservation arise, with the loss of habitat diversity, specialist invertebrate communities and a process inherent to the natural function of the stream. [Issue No. M9].

Coastal Defence

6.8.55 The coastal resource is currently being eroded through processes probably related to sea level rise. Where there is a risk to coastal grazing marshes or low-lying areas of flooding by the sea, sea defences are in place to reduce the impact of the rise. This has resulted in a 'squeeze' of the intertidal habitats lying in front of the sea defences, which occurs because the sea defences prevents the landward retreat of the intertidal habitats. Estuarine coastal defences can also pose a threat to the upstream migration of sea trout. Habitats at these locations will eventually be lost. However, given that the majority of the LEAP coast is now a designated cSAC or pSPA, there is, or will be, a statutory obligation to ensure 'favourable conservation status' of such intertidal habitats and this may lead to future possible conflicts of interest at other locations. [Issue No. M15].

6.8.56 This also has implications for the upper tidal reaches of most of the New Forest streams which exhibit well defined transitions from saline through brackish to freshwater with which are associated several nationally and internationally important coastal vegetation communities. The predicted sea level rises threaten this transition unless steps are taken to allow the migration of these communities upstream. This may mean that the management of structures such as the Lymington River sluice, the Beaulieu Mill Pond sluices and the Keyhaven sluices will need to be reviewed.

6.8.57 A Coastal Management Plan for the coastal zone of the LEAP area has been produced by NFDC (Anon, 1997).

6.9 Nature Conservation

Introduction of Alien Species

6.9.1 Of the New Forest LEAP area, the Crown Lands of the New Forest have been particularly affected by the introduction of alien species to the ecosystem. [Issue No. S4]. The following species are of particular concern, and present a significant threat to the aquatic ecology of the area:

Plants

- Australian Stonecrop (*Crassula helmsii*)
- Canadian Pondweed (*Elodea canadensis*)
- Parrot's Feather (*Myriophyllum braziliensis*)
- Japanese Knotweed (*Fallopia japonica*)
- Rhododendron (*Rhododendron ponticum*)

Animals

- American Mink (*Mustela vison*)
- Signal Crayfish (*Pacifastacus leniusculas*)

6.9.2 On the coast, a different set of plant and animal species have been introduced, albeit unintentionally, and include:-

- Hardshell Clam (*Mercinaria mercinaria*)
- Slipper Limpet (*Crepidula fornicata*)
- Japanese Seaweed (*Sargassum muticum*)

6.9.3 The effects of the introductions of these species on the indigenous ecology of the area has not been studied in any great detail, and without more detailed information, the species should be carefully controlled in line with the precautionary principle.

6.9.4 The garden centre industry poses a significant risk to the aquatic ecology of the New Forest LEAP area, importing non-native species which are often considered weeds within their natural range. Once these species are introduced to natural environments,

the potential for their spread is high, and occur at the expense of the native aquatic plant communities of the New Forest. The recent project to attempt to control *Crassula helmsii* by freezing it is an example of the work required to treat such problems.

6.9.5 The effects of mink and signal crayfish are better understood and the Agency has published literature advising the public of its concerns about the impact of these species and gives advice on how to control them.

Otter Recovery

6.9.6 Otters are known to have once been widespread in the New Forest rivers and wetlands and around the Hampshire coast. The population declined almost to extinction in the 1960s and 70s in parallel with the national population. Factors attributed to the decline were largely associated with water quality and hunting. The otter is now a protected species, hunting being banned in 1978; this combined with a national improvement in water quality has led to a recovery in the otter populations across the UK including an increase in catchments adjacent to the New Forest. However, there remain factors in the New Forest which may retard the anticipated return of otters to the area, such as water quality and quantity, fisheries management and recreation pressures. The encroachment of development and roads is of particular concern especially on the watershed between catchments where otters require safe corridors to move from one catchment to another.

6.9.7 The Southern Region of the Agency currently collaborates with the local wildlife trusts to support the South-East Otters and Rivers Project. The officer liaises with landowners, angling and recreation interests, local authorities and Agency functions to raise awareness of the plight of the otter and promote appropriate management to encourage their return to the South Coast.

6.9.8 Within the New Forest LEAP area the officers will investigate and monitor the otter populations in neighbouring catchments and assist the Agency in ensuring that suitable corridors are maintained over the watersheds. Appropriate input to strategic planning and road building will be a key feature in delivering this aim.

Fish

6.9.9 The transfers of fish into/within the New Forest LEAP area are routinely consented by the Agency. However, the release of alien species of fish represents a significant risk to the ecology within the LEAP area. Introduction of such species may result in their out-competing native species of fauna and flora or the introduction of disease agents which may endanger entire populations.

6.10 Fisheries

Angling in Rivers and Streams

6.10.1 Angling in the rivers is generally limited to the lower reaches as the Forestry Commission does not allow angling in the streams on Crown land within the Forest perambulation (Map 15), these being the spawning and nursery areas for the wild brown trout and sea trout populations.

6.10.2 The main fishing is for sea trout on their return to spawn on the Avon Water, Beaulieu and Lymington Rivers. There are some obstructions to free passage of the trout on some rivers under certain flow conditions and the Agency will seek to resolve these with riparian owners wherever possible. [Issue No. M21]. Other streams have been fished on occasions; the 1955 edition of 'Where to Fish' states that the fishing in the Dark Water is considered to be poor, and that in the Danes Stream is fair.

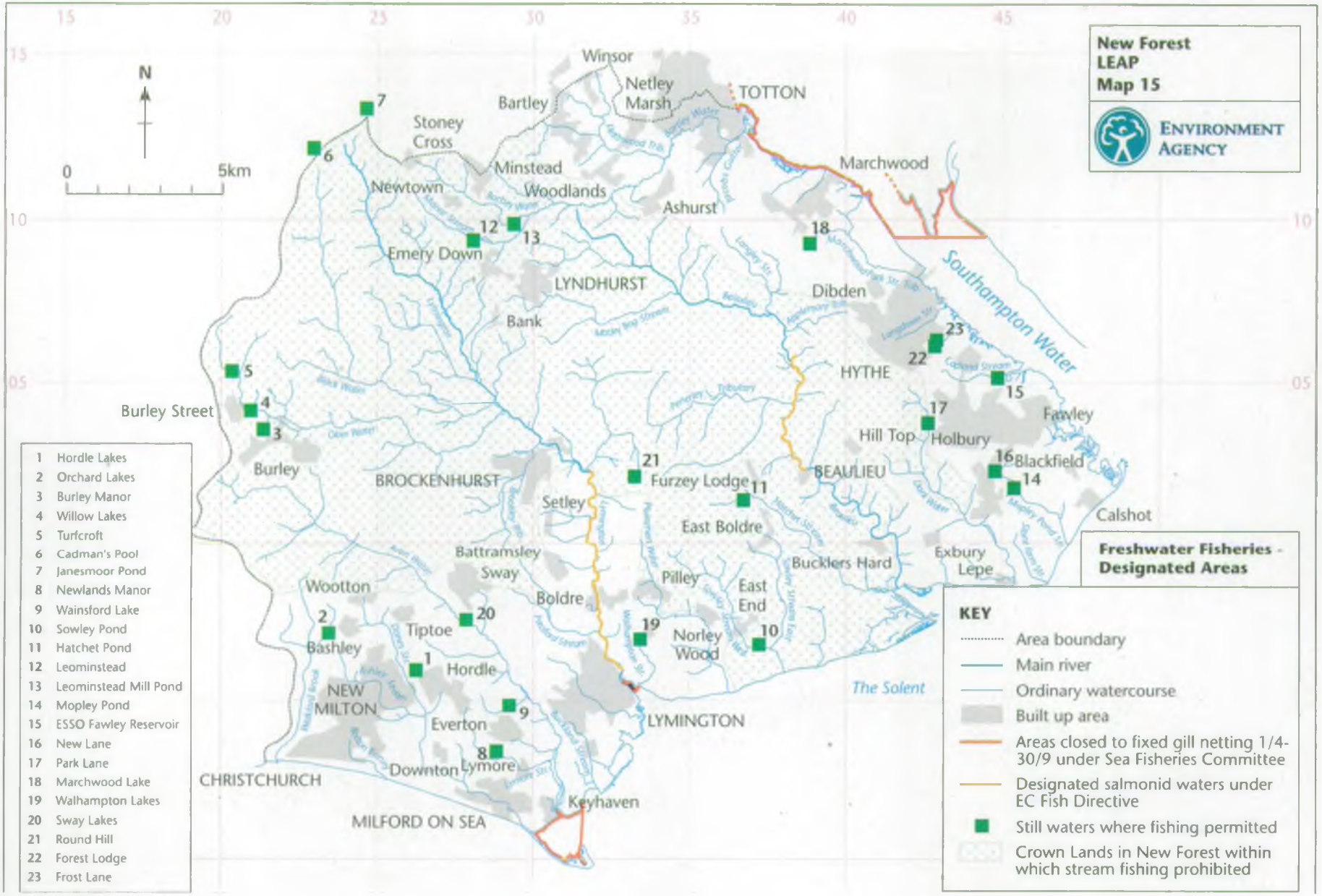
6.10.3 Catch statistics for sea trout in the three main streams have been gathered intermittently by the predecessors of the Agency; those available to 1990 are presented by Russell et al (1995).

6.10.4 Fishing on the Beaulieu is limited to the lower reaches from North Gate downstream. Annual reported catches in 1954 to 1968 ranged from 3 to 68 fish. Ashley-Cooper (1986) presents figures for 1979 - 1985 ranging from 76 to 473 fish. Official reported catches for 1990, 1993 and 1994 are 42, 54 and 74 fish respectively. Large fish occur regularly; Ashley-Cooper (1986) lists 215 fish in excess of 6lbs caught between 1979 and 1985, and Harris (1972) gives details of a fish of 16¾lb caught in 1971. The fishing is let to a syndicate.

6.10.5 On the Lymington River all fishing takes place between the Forestry Commission boundary at Ivy Wood and the sea. The availability of catch returns is again intermittent, with reported catches from 1956 to 1973 ranging from 67 to 613 sea trout per year, with a mean weight of about 1¾lb. Reported catches in recent years have been much lower, varying from zero in 1996 to 80 in 1987. [Issue No. M20].

6.10.6 Most fishing on the Avon Water takes place between Efford Mill and the tidal limit and catch statistics are even more sporadic than for other two rivers. Between 1956 and 1967 the reported catch averaged 42 sea trout per year with a mean weight of 2¼lb. No records are available since 1969.

6.10.7 There is little angling for coarse fish taking place in any of the other rivers or streams. The Agency has identified that Bartley Water is relatively under-utilised as a fishing resource and is worthy of consideration for a new public fishery. [Issue No. S11].


New Forest
LEAP
Map 15
Environment Agency
N
0
5km
Winsor
Netley Marsh
Bartley
TOTTON
Stoney Cross
Minstead
Newtown
Woodlands
Ashurst
Marchwood
Emery Down
LYNDHURST
Bank
Dibden
Southampton Water
HYTHE
Burley Street
Burley
BROCKENHURST
Setley
Furzey Lodge
BEAULIEU
Hill Top
Holbury
Fawley
Blackfield
Calshot
East Boldre
Battramsley
Sway
Pilley
East End
Bucklers Hard
Exbury
Lepe
Wootton
Boldre
Tiptoe
Bashley
Hordle
Norley Wood
The Solent
NEW MILTON
Everton
LYMINGTON
Downton
Lymore
CHRISTCHURCH
Keyhaven
MILFORD ON SEA
1 Hordle Lakes
2 Orchard Lakes
3 Burley Manor
4 Willow Lakes
5 Turfcroft
6 Cadman's Pool
7 Janesmoor Pond
8 Newlands Manor
9 Wainsford Lake
10 Sowley Pond
11 Hatchet Pond
12 Leominstead
13 Leominstead Mill Pond
14 Mopley Pond
15 ESSO Fawley Reservoir
16 New Lane
17 Park Lane
18 Marchwood Lake
19 Walhampton Lakes
20 Sway Lakes
21 Round Hill
22 Forest Lodge
23 Frost Lane
Freshwater Fisheries - Designated Areas
KEY
Area boundary
Main river
Ordinary watercourse
Built up area
Areas closed to fixed gill netting 1/4-30/9 under Sea Fisheries Committee
Designated salmonid waters under EC Fish Directive
Still waters where fishing permitted
Crown Lands in New Forest within which stream fishing prohibited

Angling in Still Waters

6.10.8 On Crown land within the perambulation of the Forest in the LEAP area (see Map 15), the Forestry Commission allow coarse fishing only in Hatchet Pond and Roundhill Pond (junior anglers only).

6.10.9 Elsewhere, angling opportunities include the following waters which are available for day ticket fishing:-

Trout	Leominstead Lakes, Lyndhurst
	Hordle Lakes, Golden Hill, New Milton
	Turcroft Farm Fishery, Burley
Coarse Fish	Orchard Lakes, Bashley, New Milton
	Sway Lakes
	Turcroft Farm Fishery, Burley
	Mopley Pond (Mopley Farm, Blackfield, Nr. Fawley)
	Dark Lane Pond, Blackfield

Commercial Fisheries

6.10.10 There are no commercial fisheries operating within non-tidal waters within the LEAP area.

6.10.11 A private right to net salmon, sea trout and other species exists on the estuary of the Beaulieu River. This right is exercised intermittently, but numbers of sea trout caught are minimal.

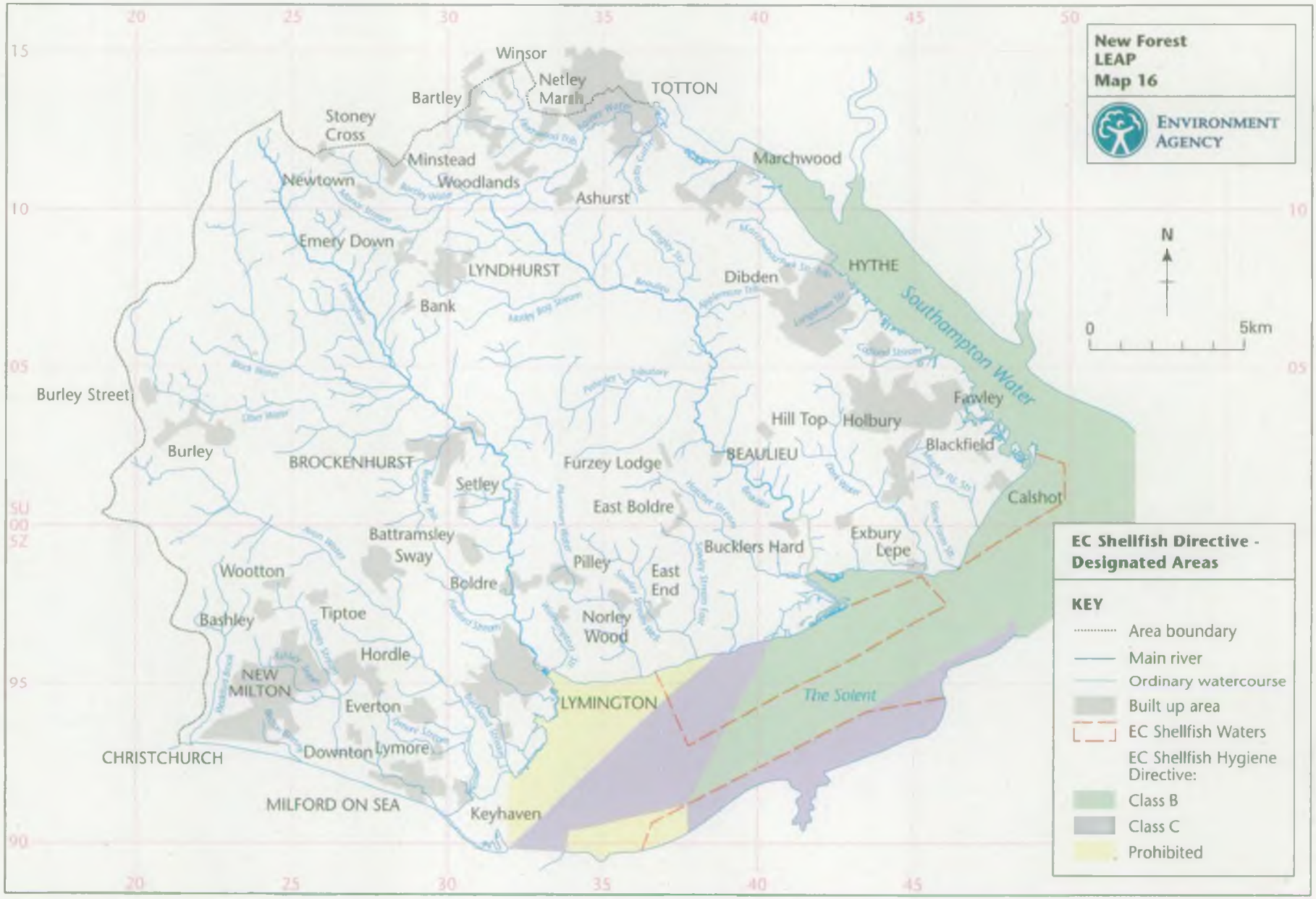
6.10.12 No other licensed nets operate for salmon or sea trout within the LEAP area, but these species are inadvertently caught in gear being operated for other species or are specifically targeted illegally. In order to protect sea trout from exploitation, no fixed gill nets are allowed to operate for capture of any species in most of the estuary of the Lymington River and in the Keyhaven area (see Map 16) between 1 April and 30 September.

6.10.13 There is a fishery for naturally produced oysters in the Solent, and three zones within the LEAP area designated under the EC Shellfish Waters Directive as 'coastal and brackish water which needs protection or improvement to support shellfish'. These are Stanswood Bay, Lepe Middle Bank and Sowley Ground; their extents are indicated in Map 16. In a survey in 1991 there were no exceedances of the set limits for heavy metals in water samples or shellfish flesh for any of these grounds.

6.10.14 However, there are extensive areas of natural production and shellfish holding outside these designated areas within the LEAP area. A review will shortly be undertaken and consideration will be given to designating all the areas that are classified under the Shellfish Hygiene Directive.

6.10.15 Under the EC Shellfish Hygiene Directive (Council Directive laying down the health conditions for the production and the placing of the market of live bivalve molluscs 91/492/EEC), areas are classified according to the level of faecal coliform bacteria in the shellfish flesh. The classification is given in Appendix E], and the current distribution of classes within the LEAP are shown in Map 16. It will be noted that much of the LEAP area is Class B, with an area of Class C and a prohibited area centred on Lymington. This is believed to be associated with discharges from the Pennington outfall and it is hoped that the planned improvements here will ameliorate the unsatisfactory shellfish hygiene situation.

6.10.16 Poaching of sea trout regularly takes place on the estuaries of the Lymington River, the Avon Water and Beaulieu River. This generally occurs by night using gill nets placed across quiet pats of the estuaries. Such nets are sometimes found on routine patrols but generally evidence of netting activity is reported to the Agency by local anglers, estate staff or others using the river. Special patrols are then mounted to intercept the poachers. The activity is kept within control by this approach but it might be considered as a war of attrition as committed poachers re-offend and new individuals become involved. Speedy apprehension, confiscation of gear and vehicles and severe court penalties discourage escalation of the problem. [Issue No. M22].


New Forest
LEAP
Map 16
Environment Agency
N
0
5km
Winsor
Netley Marsh
Bartley
TOTTON
Stoney Cross
Minstead
Woodlands
Newtown
Ashurst
Marchwood
Emery Down
LYNDHURST
Dibden
HYTHE
Bank
Southampton Water
Burley Street
Fawley
Hill Top
Holbury
Blackfield
Burley
BROCKENHURST
Furzey Lodge
BEAULIEU
Setley
East Boldre
Calshot
Battramsley
Sway
Bucklers Hard
Exbury
Lepe
Pilley
East End
Wootton
Boldre
Bashley
Tiptoe
Norley Wood
Hordle
NEW MILTON
LYMINGTON
The Solent
Everton
Downton
Lymore
CHRISTCHURCH
MILFORD ON SEA
Keyhaven
EC Shellfish Directive - Designated Areas
KEY
Area boundary
Main river
Ordinary watercourse
Built up area
EC Shellfish Waters
EC Shellfish Hygiene Directive:
Class B
Class C
Prohibited

Chapter 7

Targets and the State of the Environment

This chapter looks at different aspects of environmental media such as air, water and land and considers what standards are available to allow us to assess the state of the environment within and between these media.

CHAPTER 7: TARGETS AND THE STATE OF THE ENVIRONMENT

7.1 Nature Conservation

7.1.1 The targets against which nature conservation issues in the LEAP area are assessed, and for which the Agency is responsible, can be evaluated against the requirements of the:-

- 1995 Environment Act;
- 1992 Habitats Directive;
- Biodiversity : UK Steering Group Report (Anon, 1994);
- Memorandum of Understanding (MOU) between English Nature and the Agency 1996;
- New Forest River Corridor Survey Report 1996/97.

1995 Environment Act

7.1.2 The 1995 Environment Act requires the Agency to promote the conservation of flora and fauna dependent on the aquatic environment in all its functions as an operator, regulator and adviser to further, or have regard to, the conservation of nature, landowners and archaeological heritage.

7.1.3 Within this remit, the Agency is also a consultee for all planning applications which affect watercourses, wetlands, or land uses which require abstraction, impoundment, fish stocking, discharge or land drainage consents and authorisations for Waste Management Licences. With respect to these powers, the Agency will object to all applications which significantly affect the nature conservation value of statutory and non-statutory designated sites and associated protected habitats and species. Where there are overriding reasons for allowing applications which would have an adverse effect on habitats and features of nature conservation interest, then the Agency shall seek to gain maximum compensation to mitigate the loss.

1992 Habitats Directive

7.1.4 The 1992 Habitats Directive requires the Agency, as a 'Competent Authority', to maintain a 'favourable conservation status' of those habitats which are afforded international protection, and which may be affected by Agency activities.

7.1.5 Furthermore, in accordance with the requirements of the regulators, the Agency has started and will continue to review all authorisations and functions that may compromise the 'favourable conservation status' of sites afforded statutory protection because of their international importance for nature conservation. The Agency will aim to resolve any conflicts of interests so identified.

7.1.6 As an **operator**, the Agency has started and will continue to conduct appropriate assessments of all its own operations (e.g. coastal defence works), activities (e.g. flood defence maintenance works) and plans (e.g. Shoreline Management Plans) which may significantly affect sites of European importance.

7.1.7 As a **regulator**, the Agency will properly screen and appraise all future applications for consents and authorisations for their potential impact on European sites and will strictly adhere to the requirements of the Habitats Regulations and PPG9 to maximise environmental protection.

7.1.8 As an **influencer**, the Agency will aim to liaise with English Nature, the Forestry Commission, Hampshire County Council and others in the setting of Conservation Objectives and Management Plans or schemes of management for all sites protected under European legislation within the LEAP area. Specifically, the Agency will work with and support the New Forest LIFE Partnerships to secure Natura 2000 objectives in the New Forest.

Biodiversity : UK Steering Group Report (Anon. 1994)

7.1.9 The Biodiversity : UK Steering Group Report (Anon, 1994) allocates the Agency with responsibility for delivering the Biodiversity Action Plans (BAPs) for a number of specific species and habitats of national conservation concern.

7.1.10 The Biodiversity Steering Group was set up in response to the Biodiversity Convention signed by the UK Government at the Rio Earth Summit in 1992. The Steering Group was established to oversee a number of tasks including the development of conservation targets for key species and habitats, and increasing public awareness of conservation issues. This has been incorporated into a Steering Group Report that presents a costed action plan for the conservation and enhancement of 14 key UK habitats and 116 species.

7.1.11 Each BAP has specific action points with responsible agencies (including the Agency) clearly identified. The Agency is tasked with taking a lead on many of these actions and several of the generic threats fall within its remit. For example, 20 of the 116 species are expected to benefit from action to maintain or improve water quality; Flood Defence Water Level Management Plans are identified as a requirement for 13 species.

7.1.12 In order to meet the overall objectives of biodiversity, whilst recognising its obligation to consider costs and benefits, the Agency has adopted the following policies:-

i) Priority will be given to achievement of actions required under the UK Plan before resources are dedicated to implementing additional actions in Regional or County Biodiversity Action Plans.

ii) Unless there is clear evidence to the contrary, the Agency will assume that maintenance of existing environmental standards is sufficient to provide the levels of protection required by individual species and habitat plans.

iii) In prioritising new and existing activities to meet actions under the UK Plan,the

Agency will, as well as considering relative costs, give priority firstly to those plans where Agency action is required to prevent a decline in status (rather than maintain the status quo or effect an improvement) and secondly, to those that are most dependent on the powers and expertise unique to the Agency.

Hampshire Biodiversity Challenge

7.1.13 In partnership with a number of agencies including English Nature, Hampshire Wildlife Trust, National Farmers Union, Country Landowners Association and the Agency, Hampshire County Council is currently working on a Biodiversity Action Plan for Hampshire, to be published during 1998. It is expected that the Plan will include both habitats and species relevant to the area encompassed by the New Forest LEAP.

Agency Policy for Species Listed in the Biodiversity Action Plan in the LEAP Area

7.1.14 The UK Biodiversity Steering Group Report names the Environment Agency as the 'Contact' agency for 13 plant and animal species that depend upon aquatic environments and one habitat (chalk stream) which are listed as those which require specific conservation efforts to ensure their continued survival.

7.1.15 The Agency will take the lead to deliver the Action Plans defined in 'Biodiversity : The UK Steering Group Report, Volume II : Action Plans' (Anon, 1994), for which it is the 'Contact' point and will support, through consultation, the production of plans for a further nine species and 13 habitats for which it has national responsibilities.

7.1.16 Of those species for which the Agency is the Contact agency, the following occur within the New Forest LEAP area:-

- Water Vole *Arvicola terrestris*
- Otter *Lutra lutra*
- Freshwater White-clawed Crayfish *Austropotamobius pallipes*
- Southern Damselfly *Coenagrion mercuriale*

Species and Habitats for Which the Agency has Defined Responsibility

Responsibilities Within the LEAP Area

7.1.17 Of those species and habitats for which the Agency has defined national responsibilities but is not the 'Contact', the following occur in the New Forest LEAP area:-

- Penny Royal *Mentha pulegium*
- Pillwort *Pilularia globulifera*
- Scarce Blue-tailed Damselfly *Ischnura pumilio*

- White-legged Damselfly *Platycnemis pallipes*
- Mole Cricket *Grylloptalpa grylloptalpa*
- Marsh Fritillary *Evodryas aurinia*
- Dung Beetle *Aphodius niger*
- Black Bog Ant *Formica candida*
- Bat Species
- Heathland and associated habitats
- Acid Pools
- Grazing Marsh/Wet Grassland
- Reedbeds
- Fen/Carr/Swamp/Marsh
- Open Standing Water
- Temporary Pods
- Shingle
- Coastline Strandline
- Saltmarsh
- Sand Dunes
- Mudflats/Eelgrass Beds

Memorandum of Understanding between English Nature and the Agency

7.1.18 In 1995 the Agency and English Nature signed a Memorandum of Understanding (MOU) to establish a mutual understanding and common purpose regarding the protection and management of rivers identified as SSSIs. The River Lymington is one of a series of riverine SSSIs across England and Wales. The Agency will support English Nature in producing and implementing a Consenting Protocol and a Conservation Strategy, setting out jointly agreed objectives and a plan of action over a 10 year period, for the River Lymington SSSI.

New Forest River Corridor Survey Report

7.1.19 The Agency commissioned a River Corridor Survey (RCS) of the New Forest area in 1996/97. This followed a nationally standardised ecological survey methodology to describe, clarify and monitor the conservation 'resource' of the area's watercourses. By highlighting important features which need protection and identifying opportunities to rehabilitate and enhance degraded habitats, RCS is an essential tool by which the Agency fulfils its statutory duties.

7.1.20 The Agency will use the New Forest RCS database to monitor environmental change in the LEAP area, protect important features through input to the planning and development control process, help guide and influence its own operations and to target resources for habitat enhancement schemes.

7.2 Water Resources

7.2.1 The Agency aims to manage the water resource of the area to achieve the right balance between the needs of the environment and those of the abstractors. A significant proportion of the New Forest LEAP area is SSSI habitat, supporting a number of species listed in the UK Biodiversity Action Plan, and these are primarily controlled and sustained by water. To this end, the balance between the needs of the environment and those of the abstractors is weighted heavily in favour of the environment.

7.2.2 To enable it to carry out its duties, the Agency maintains a network of recording stations where hydrometric information such as rainfall, river flows and levels and groundwater levels is collected. This information provides the basis for water resource assessments and management as well as wider application in the Agency's other functions such as flood defence and water quality. See Map 17.

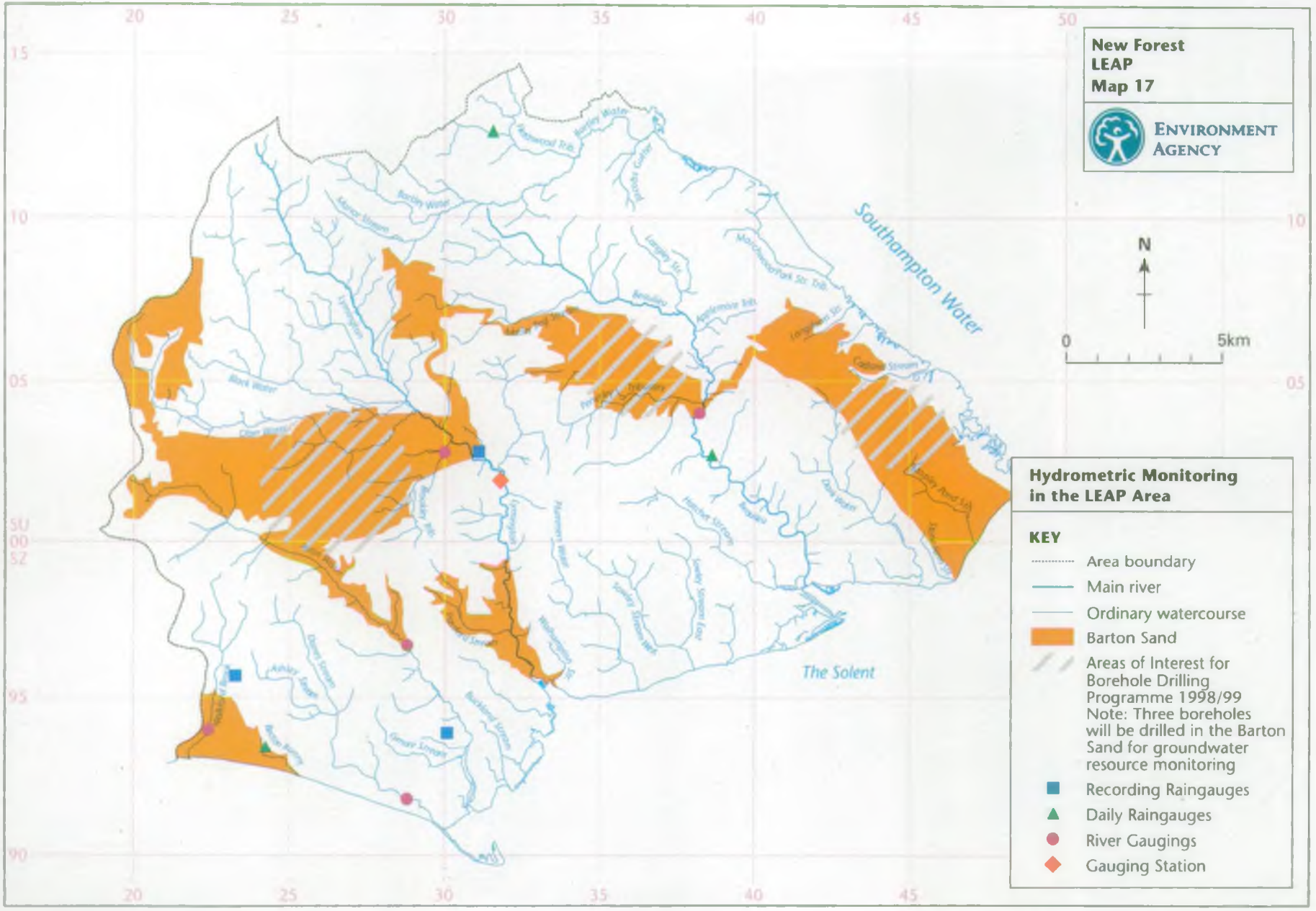
7.2.3 The lack of major water resource availability in the New Forest has never justified the considerable investment in hydrometry which has been made, for example, in the Test and Itchen catchments. The single permanent gauging station in the River Lymington at Brockenhurst was associated with flood alleviation schemes. No groundwater observation boreholes, each of which would cost in the range £5,000 to £20,000, have ever been drilled. Some information has been gleaned from geological maps and existing groundwater abstractions, but it is now necessary to weigh the benefits of developing the framework of a borehole network against the substantial costs. The Agency is keen to extend its monitoring network in the LEAP area. [Issue No. M6].

7.2.4 Rainfall is monitored more extensively, with three daily gauges operated by private observers and three Agency automatic gauges, two of which are connected to telemetry and provide data in real time for flood defence and drought management purposes.

7.2.5 Spot flow measurements are taken on a monthly basis at five locations in the LEAP area. Water level gauges in the Lymington estuary provide warnings of extreme high tides and monitor the operation of the tide gates. Figure D shows the 1995 flow hydrograph for the permanent gauging station at Brockenhurst and demonstrates the large range in flow rates due to seasonal effects and periods of heavy rainfall.

7.2.6 The Agency's prime target in managing the water resources is to protect and conserve whilst also meeting the demands of society. We assess the balance between the available water resource and the licensed water usage to ensure that the water resource is used in a sustainable manner.

7.2.7 There are no specific licensing policies related to the LEAP area but there are policies which apply to the Southern Region of the Agency. The Agency has a presumption against issuing summer abstraction licences for consumptive purposes and winter storage is the only potential for resources development.


New Forest
LEAP
Map 17
Environment Agency
N
0
5km
Southampton Water
The Solent
Hydrometric Monitoring in the LEAP Area
KEY
Area boundary
Main river
Ordinary watercourse
Barton Sand
Areas of Interest for Borehole Drilling Programme 1998/99
Note: Three boreholes will be drilled in the Barton Sand for groundwater resource monitoring
Recording Raingauges
Daily Raingauges
River Gaugings
Gauging Station

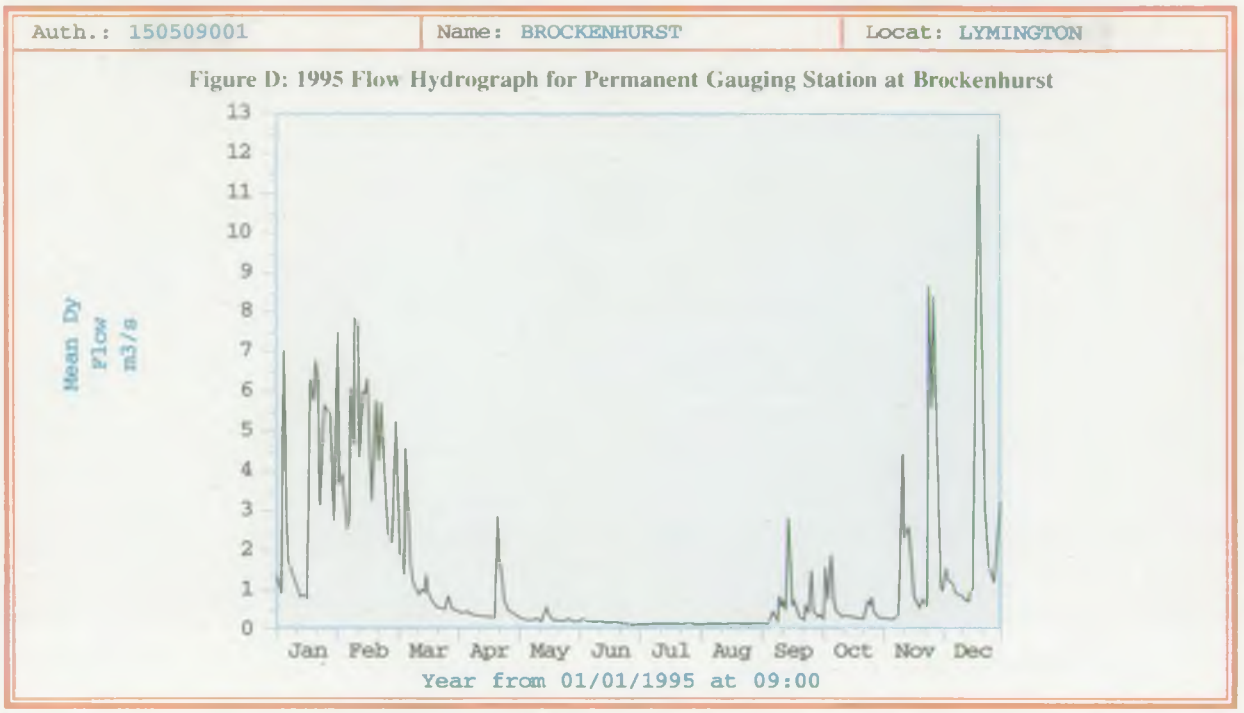


Figure D: 1995 Flow Hydrograph for Permanent Gauging Station at Brockenhurst

7.2.8 Further demand for water is anticipated from both intensification of agriculture in the fertile coastal plain and residential developments. Throughout Southern Region, demand from public water supply sources appears to be relatively static or may even decline as more households are metered and more importantly as leakage from mains pipes is reduced. The Agency is confident that any increase in demand over the next few years for public water supply can be accommodated within existing licences. The increase in agricultural demand can be accommodated to a limited extent by constructing reservoirs filled in winter from rivers during periods of high flow. However, there is increasing pressure to exploit minor aquifers for agricultural purposes. This needs to be closely controlled and assessed because over-abstraction from these aquifers may have substantial dewatering impacts on small springs, streams and valley mires.

7.2.9 The Agency (Southern Region) has recently updated its Water Resource Development Strategy in a document entitled 'Sustaining Our Resources - Update 1997'. This document sets out how the Agency intends to see water resources developed in the future. The strategy in the document follows the principles of sustainable development with proper safeguards for the environment. Generally therefore, the Agency:-

- expects the efficient use of water;
- plans abstraction such that there is minimal environmental impact;
- studies rivers stressed by abstraction and looks for cost efficient measures to redress environmental problems.

7.2.10 Of particular concern in the LEAP area is the question of target river flows. In this document we have highlighted as an issue the particular problems with regard to over-abstraction from rivers for spray irrigation during the summer months. In the consideration of new abstraction licence applications, the Agency sets minimum river flow conditions.

Although rivers and streams are sensitive to abstraction during low flow periods, it is equally important to set minimum river flow conditions on winter abstraction licences. Winter storage reservoir abstractions are often linked to minimum river flows or river level conditions to preserve seasonal high flow periods vital to sea trout migration and other wildlife.

7.2.11 With little hydrometric and hydrogeological data on which to base these decisions the precautionary principle has to be invoked in order to protect existing water rights and environment needs. Significant development of the limited water resources of the LEAP area will require further investment by the Agency in hydrometric networks to assess and measure the water cycle and the impact of abstraction.

7.2.12 Low flows are an identified problem, which the Agency has taken measures to redress, in the Avon Water and the Walkford Brook. We also consider that Danes Stream, Plummers Water, the Beaulieu River, Dark Water, Stanwood Stream and Sowley Stream are watercourses at risk from over-abstraction in the summer months.

Licensing

7.2.13 Nationally, the Agency has two particular problems with water abstraction. These are:-

- Trickle Irrigation; which does not currently require an abstraction licence and which has the potential to be highly consumptive. [Issue No. M1].

- Licences of Right; generally issued over 30 years ago, which are seldom restricted by environmental conditions and therefore can allow the abstraction of large volumes of water from modest natural resources. There are cases where these licences authorise abstraction for spray irrigation of quantities greater than the summer flow rate of the relevant river. There has been some local success in reducing unused licences but the legislative requirement to compensate the holders of licences in regular use precludes effective action.

7.2.14 Both of the above issues will form an important element of the current review of the licensing system by the DETR.

7.3 Water Quality

7.3.1 The Agency aims to maintain and, where problems are identified, improve the quality of water to levels appropriate for its use and its natural condition.

7.3.2 The Water Resources Act 1991 makes provision for the introduction of Statutory Water Quality Objectives the purpose of which is to establish targets, on a statutory basis, that provide an agreed planning framework for regulatory bodies, dischargers, abstractors and river users.

7.3.3 The Statutory Water Quality Objective Scheme is use-related based upon a range of Water Quality standards that protect the 'uses' to which waters may be put. The River Ecosystem (RE) use is the first of the Statutory Water Quality Objective uses to be introduced.

7.3.4 Statutory Water Quality Objectives can only be set formally through Notices served by the Secretary of State for the Department of the Environment, Transport and the Regions.

7.3.5 Although at the present time there are no Statutory Water Quality Objectives proposed for rivers within the New Forest LEAP area, the Agency has proposed non-statutory River Quality Objectives (RQOs) and the River Ecosystem system of water quality standards has been applied in setting these objectives.

7.3.6 The Surface Waters (River Ecosystem Classification) Regulations 1994 specify the classification scheme which has been applied in setting RQOs, and comprises the classes summarised below:

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

A table showing the water quality criteria defining these classes is shown in Appendix E.

7.3.7 The proposed long term RE River Quality Objectives are shown in Table 27 below:-

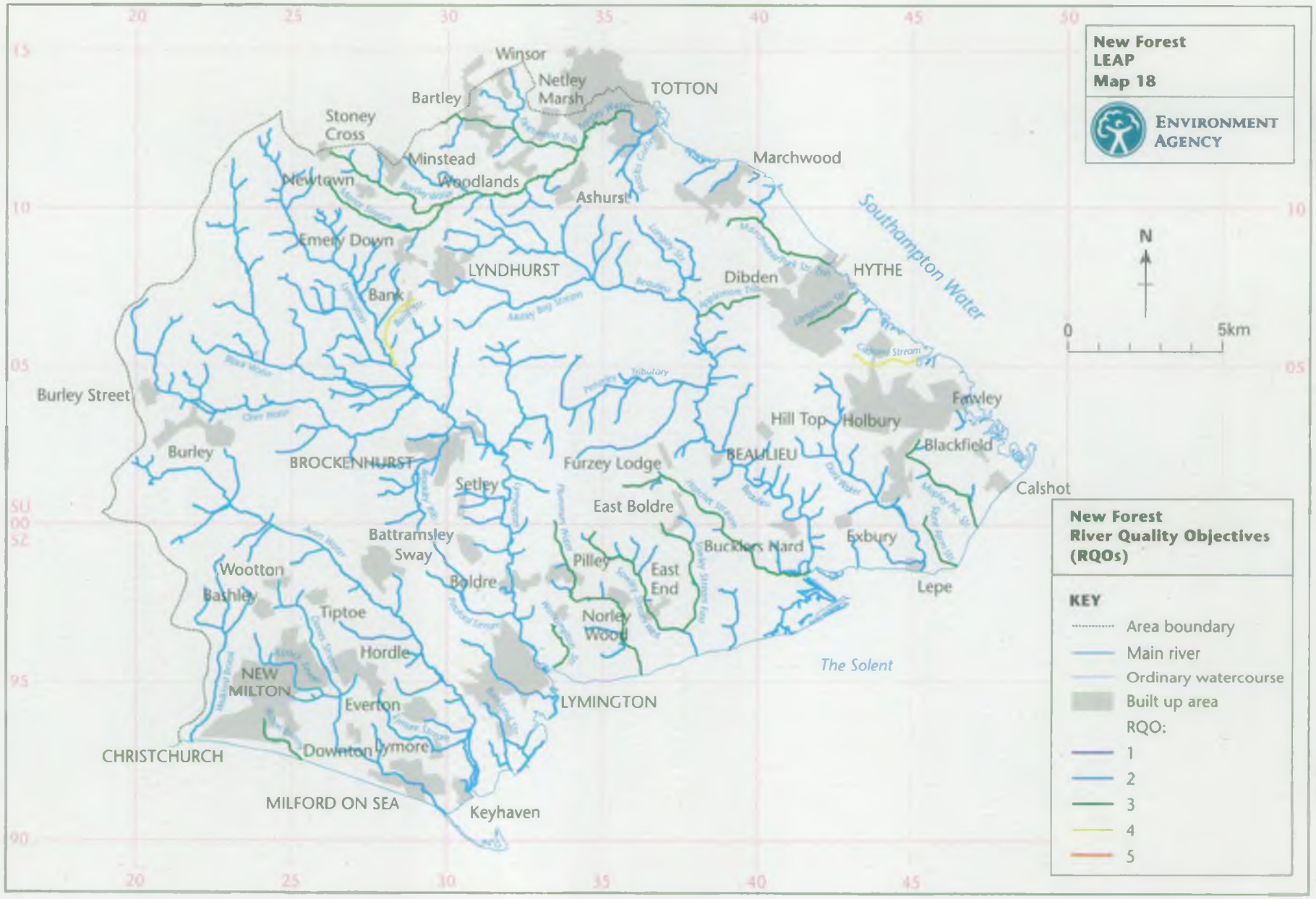
Table 27 - Non-Statutory River Quality Objectives

RIVER STRETCH	NAME OF WATERCOURSE	PROPOSED RQO (RE)	PROPOSED LONG-TERM RQO (RE) AND DATE
Langdown Stream	Langdown Stream	3	
Cadland Stream	Cadland Stream	4	
Stone Farm Stream	Stone Farm Stream	3	
Gatewood Bridge	Dark Water	2	
Hartford Bridge	River Beaulieu	2	
Ipley Manor	River Beaulieu	2	
Applemore Trib	Applemore Trib	3	

Langley Stream	Langley Stream	2	2 (2005)
Matley Bog	Matley Bog Stream	2	
St Leonards	Hatchet Stream	3	3 (2005)
Penerley Trib	Penerley Trib	2	
Beck Farm	Sowley Stream (E)	3	
East End	Sowley Stream (W)	3	
Plummers Water	Plummers Water	3	
Boldre Bridge	River Lymington	2	
Whitley Bridge	River Lymington	2	2 (2005)
Ashurst Bridge	Bartley Water	3	
Mannor Stream	Bartley Water	3	
Pottensford Bridge	Bartley Water	3	
Fletchwood Trib	Bartley Water	3	
Balmer Lawn	River Lymington	2	
Brookley Trib	Brookley Trib	2	
Ober Water	Ober Water	2	
Black Water	Black Water	2	
Buckland Stream	Buckland Stream	2	
Bank Stream	Bank Stream	4	4 (2005)
Walhampton Stream	Walhampton Stream	3	3 (2005)
Ampress	Passford Water	2	
Efford Mill	Avon Water	2	
Gordleton	Avon Water	2	2 (2005)
Arnewood Manor	Avon Water	2	
Lymore Stream	Lymore Stream	2	
Milford-on-Sea	Dane Stream	2	2 (2005)
Golden Hill	Dane Stream	2	2 (2005)
Ashley Stream	Ashley Stream	2	
Becton Bunny	Becton Bunny	3	3 (2005)
Walkford Brook (A337)	Walkford Brook	2	

RE - River Ecosystem Classification. Based on three years data (1994 - 1996).

These RQOs are shown on Map No. 18.


New Forest
LEAP
Map 18
Environment Agency
N
0
5km
Winsor
Netley Marsh
Bartley
TOTTON
Stoney Cross
Minstead
Woodlands
Newtown
Marchwood
Ashurst
Southampton Water
Emery Down
LYNDHURST
Bank
Dibden
HYTHE
Burley Street
Burley
BROCKENHURST
Setley
Furzey Lodge
Hill Top
Holbury
Fawley
Blackfield
BEAULIEU
Calshot
East Boldre
Battramsley
Sway
Buckler's Hard
Exbury
Lepe
Wootton
Bashley
Boldre
Pilley
East End
Tiptoe
Norley Wood
Hordle
NEW MILTON
The Solent
Everton
LYMINGTON
Downton
Lymore
CHRISTCHURCH
MILFORD ON SEA
Keyhaven
New Forest
River Quality Objectives
(RQOs)
KEY
Area boundary
Main river
Ordinary watercourse
Built up area
RQO:
1
2
3
4
5

7.3.8 By setting RQOs the Agency aims to:-

- protect and, if practicable, improve current water quality;
- achieve sustainable standards for future uses of the Resource;
- improve the riverine and aquatic habitat.

General Quality Assessment (GQA)

7.3.9 The periodic assessment of analytical data, obtained from routine chemical and biological monitoring programmes, produces a clearer picture in highlighting trends in water quality.

7.3.10 Periodic assessment is now made by applying the General Quality Assessment (GQA) Scheme which provides a general measure of water quality. In order to obtain a comprehensive picture of river water quality different aspects (or windows) are viewed, providing a different perspective on the overall quality. The GQA scheme comprises four such windows and these are the Chemistry, Biology, Nutrient and Aesthetics windows. The Chemistry GQA window comprises six water quality grades which reflect different levels of pollution. These grades are a sub-set of the chemical standards in the River Ecosystem Classification Scheme and are listed in Appendix E.

7.3.11 Whereas the Chemistry GQA window grades reflect degrees of pollution at the time of sampling, the Biology GQA window assesses the health of river stretches through the diversity of tiny animals (macro-invertebrates) that live on the bed of the river. This provides a longer term picture and the best overall guide to the health of the river ecosystem. However, it is more practicable to monitor discharge consents and legislate on the basis of chemical parameters.

7.3.12 If a river or stream is polluted, even for a short period of time, some or all of the macro-invertebrate animals may die. Over a longer term, macro-invertebrates that are more tolerant of the poor water quality will dominate the community. In both cases, the recovery of communities may take several months. The recovery of these communities may take several months and consequently biological monitoring provides pollution information that may have been missed by solely employing chemical monitoring. As with the Chemistry GQA, the Biology GQA applies a water quality grading scheme comprising six grades based upon the diversity of the variety of macro-invertebrate families present. These are listed in Appendix E.

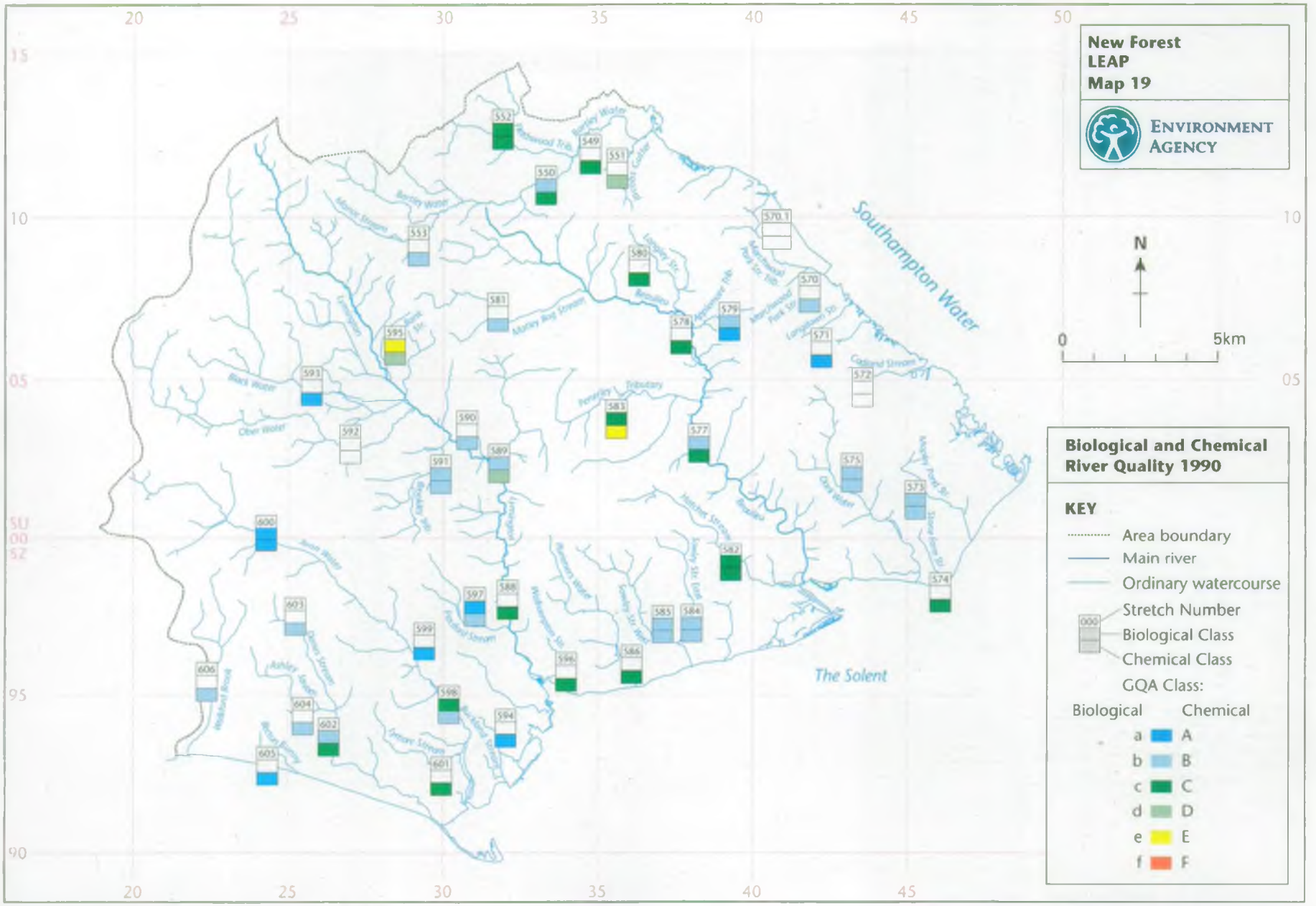
7.3.13 In addition to the Chemistry and Biology GQA windows, two other windows - the Nutrient GQA and the Aesthetics GQA are under development. The Nutrient GQA will address levels of certain nutrients which are present in rivers, including nitrogen and phosphorous. These simple chemical substances used by plant life can cause excessive plant growth when present in high concentrations. This may result in algal blooms and could give rise to eutrophication problems. The Aesthetics GQA takes account of the public perception of water quality which is mainly influenced by appearance and odour.

General Quality Assessment Results 1990 - 1995

7.3.14 The current chemical and biological quality of the New Forest LEAP area rivers under the GQA scheme for 1990 and 1995 are shown on Maps 19 and 20 respectively. These maps are taken from the Agency's internal report 'The Biological Quality of the Rivers of Southern Region 1990 to 1995' as produced by our Area Biology Team and Regional Pollution Prevention and Control Science Group.

7.3.15 The report shows that the Main Rivers in the LEAP area are generally of good or very good biological quality whilst the quality of the tributaries is varied. The tributaries generally have a satisfactory quality but some do show the effect of low flows and intermittent pollution inputs. In particular the data shows that:-

- Bartley Water and its tributaries are all of good or very good biological quality.
- The Waterside streams are generally of good or fairly good biological quality with the exception of Langdown Stream which is biologically poor (Grade e). The entire length of Langdown Stream is contained within Hythe and the poor biological quality probably results from intermittent pollution. These results demonstrate how the biological GQA monitoring is a far more reliable indicator of the status of the river ecosystem than the chemical GQA monitoring.
- The Beaulieu river is of very good quality both with respect to biology and chemistry. Applemore Stream, Hatchet Stream and Pennerly Water have shown a variable quality with instances of lower gradings mainly related to low flows.
- Sowley Stream is generally of good biological and chemical quality.
- Plummers Water is of fair biological quality.
- The River Lymington is of very good biological quality whilst the quality of the tributaries varies from very good to fairly good. Bank Stream below the waste water treatment works has improved from biological Grade e in 1990 to Grade b in 1995. However, the chemical quality is still poor on account of low DO values which are probably related to BOD and nutrient input and low dilution of treated sewage effluent.


New Forest
LEAP
Map 19
Environment Agency
N
0
5km
Southampton Water
The Solent
Biological and Chemical
River Quality 1990
KEY
Area boundary
Main river
Ordinary watercourse
Stretch Number
Biological Class
Chemical Class
GQA Class:
Biological
Chemical
a A
b B
c C
d D
e E
f F
20
25
30
35
40
45
50
15
10
05
95
90
SU
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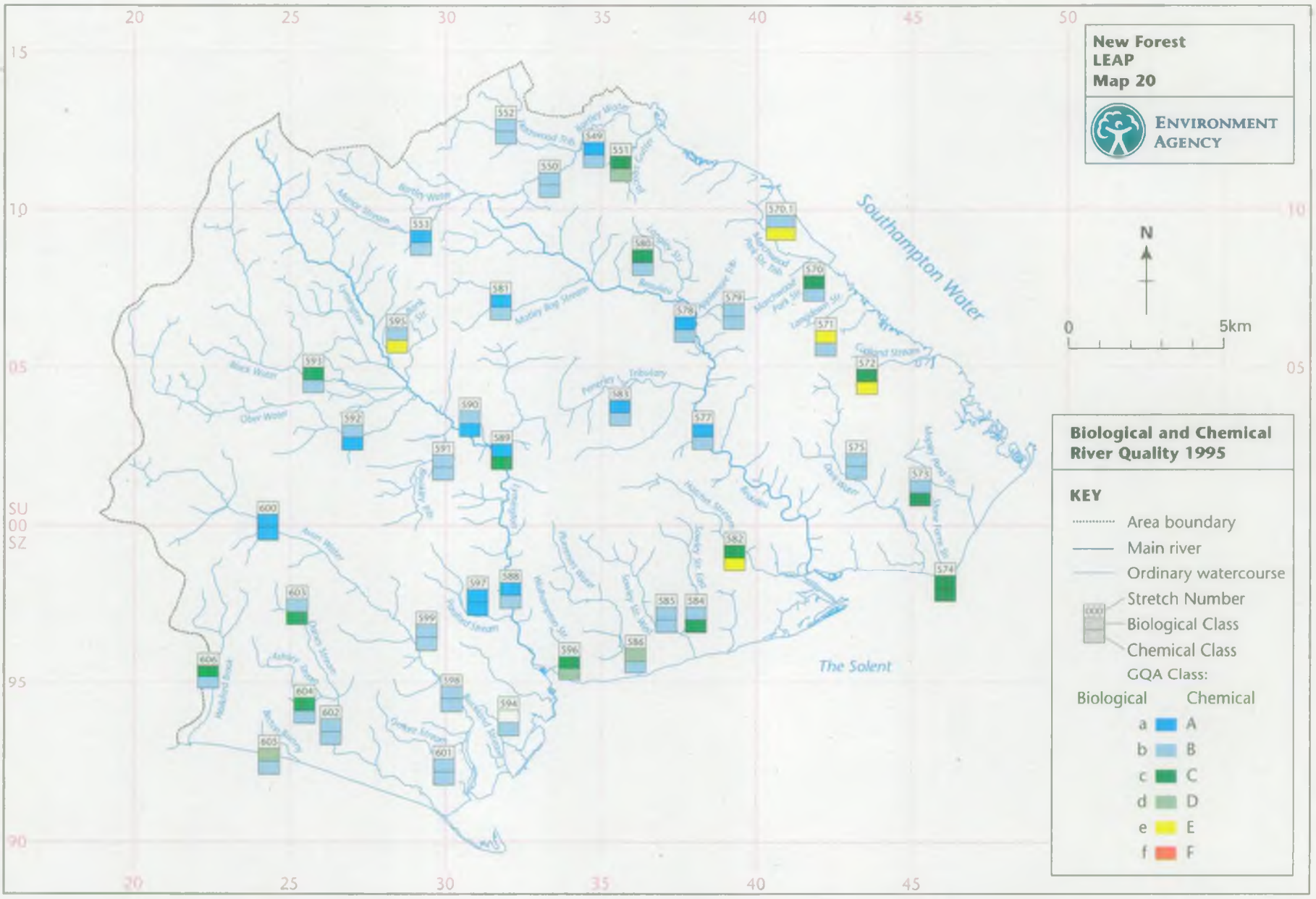
New Forest
LEAP
Map 20
Environment Agency
N
0
5km
Southampton Water
The Solent
Biological and Chemical River Quality 1995
KEY
Area boundary
Main river
Ordinary watercourse
Stretch Number
Biological Class
Chemical Class
GQA Class:
Biological
Chemical
a A
b B
c C
d D
e E
f F
20
25
30
35
40
45
50
15
10
05
SU
00
SZ
95
90

- Avon Water, Lymore Stream and Danes Stream are of good or very good biological quality.

- Ashley Stream, Walkford Brook and Becton Bunny are of fair or poor biological quality and this reflects the urban catchment of these waters.

7.3.16 Results indicate that the main pressures on the river ecosystems probably occur due to urban run-off. The Agency will, where there are definite environmental benefits, actively promote urban run-off management schemes that aim to retain and detain urban run-off in balancing ponds and create wetland habitats which allow the natural purification and cleansing of waters prior to slow long-term release to the natural watercourses. Integral to these slow release methods are reed beds (or root zone technologies) which purify water by lowering oxygen demand, filtering out suspended solids and extracting metals in the process of plant growth. The Agency will encourage the use of reed beds in urban waste water management and waste water treatment works where they are of a benefit to the environment. Reed beds help to ensure a high quality of discharged water, maintain flows during drought periods and provide an important ecological habitat.

The Agency's Water Quality Monitoring Network

7.3.17 The type, amount and frequency of water quality monitoring the Agency conducts in the LEAP area are summarised in Table 28 below:-

Table 28 - Agency Water Quality Monitoring Programme

TYPE	NO. OF LOCATIONS	FREQUENCY OF MONITORING
Bathing Waters Monitoring	6	20 / annum (May - September)
Effluent Edge of Mixing Zones Monitoring (associated with IPC processes)	6	12 / annum
Estuary Monitoring	13	12 / annum
Rivers Monitoring (GQA Assessment) (includes biological quality monitoring)	41	12 / annum
Rivers Monitoring (Biological Quality)	40	2 / annum every 5th year 2 / annum alternate years between
Sediment Analysis (Downstream Effluents)	7	2 / annum
Waste Water Treatment Works Monitoring	44	1 to 24 times per annum (depending on size of WWTW)
TBT (Ship Anti-fouling) Monitoring	13	2 / annum
Trade Effluent Monitoring	8	1 to 24 times per annum (depending on volume of consented discharge)
Urban Waste Water Treatment Directive Monitoring	9	12 / annum

Groundwater Monitoring

7.3.18 The New Forest LEAP area is underlain by a series of sands and clays and is mainly a non-aquifer with areas of minor aquifer. There is no major aquifer within the LEAP area. There is effectively no groundwater monitoring network within the New Forest LEAP area with which we can assess the state of the groundwater resource. [Issue No. M6].

7.3.19 Groundwater contamination is not considered to be a problem in the LEAP area due to the undeveloped nature of the New Forest area. However, groundwater contamination in the form of metals, oils and solvents from industrial processes which have now ceased has been identified in the shallow aquifer at Ampress Works near Lymington. At Ampress Works, the Bournemouth & West Hampshire Water Company has a significant public water supply abstraction. This site was developed to abstract water from the shallow aquifer (now contaminated) and a very much deeper (near artesian) aquifer. Abstraction from the shallow aquifer has ceased, but abstraction continues from the deep aquifer as there has been no contamination of this resource. Currently the Agency is monitoring the Passford Water which flows near the site and there is no evidence of any adverse impact on the watercourse by the contaminated groundwater (Passford Water has a very good rating in terms of both chemical and biological GQA assessment). The Ampress site area is under consideration for development and should any substantial development occur, we will require any developer to suitably remediate or isolate the contamination.

7.4 Flood Defence

Flood Defence Standards of Service

7.4.1 As an aid to decisions on priorities for works the Agency has determined Standards of Service for flood defence based on land usage within the floodplain. Five 'land use bands' have been established, based on the presence and concentration of certain features of land use. These include housing, commercial property, agriculture and transport networks. Such features are each allocated a financial value (based on the potential losses that would ensue if the features were subject to flooding) which allows comparison of different features on the same basis. Each land use band has a target for the maximum flood risk to which it should be exposed. The standards are expressed as a percentage which reflects the likelihood that during any year a flood event may occur which exceeds the magnitude for which protection is available or should ideally be provided.

7.4.2 For example, a standard of 2% means that for any given year the likelihood of a flood flow occurring which significantly affects key land use features, is 50 to 1 or 2% in any one year. Details of targets and land use bands are given in Table 29 below. The Agency is in the process of producing maps of the various land used bands for Main Rivers in this catchment. [Issue No. M14]. A comparison of the target and actual standards of service will allow improvement and maintenance works to be prioritised towards those rivers which do not meet their targets.

Table 29 - Standards of Service, Land Use Bands and Targets

Land Use Band	Description of Typical Land Use	Target Standard of Protection (Return Period)	
		Fluvial	Saline
A	Urban	1:50 - 1:100	1:100 - 1:200
B	Lower density urban	1:25 - 1:100	1:50 - 1:200
C	Isolated rural communities	1:5 - 1:50	1:10 - 1:100
D	Isolated properties /intensive farming	1:1.25 - 1:10	1:2.5 - 1:20
E	Low grade agricultural land	< 1:2.5	< 1:5

Flood Warning Standards of Service

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

7.5 Air Quality

Targets

7.5.1 Air quality standards and guidelines provide the basis for assessing whether or not air quality is acceptable. The principal focus is on the protection of human health, for which legal standards exist. The Department of the Environment has set up an independent Expert Panel on Air Quality Standards, to evaluate the medical evidence and help formulate health based standards. In addition, internationally recognised guidelines have been developed to help protect sensitive vegetation. There are no widely accepted guidelines for nuisance dust or odours, although informal guidance does exist. The targets adopted by the EA are based on:-

Legal standards for sulphur dioxide, smoke, nitrogen dioxide and lead. These are based on European Union Directives. These Directives are currently being revised.

Standards for sulphur dioxide, nitrogen dioxide, ozone, PM_{10}, carbon monoxide, benzene, 1,3 butadiene and lead. These have recently been adopted by the UK Government. They will be implemented as **Objectives** to be met by the year 2005.

Guidelines for sulphur dioxide, nitrogen dioxide and ozone, to protect sensitive vegetation. These have been developed by the World Health Organisation.

The targets for this LEAP are set out in Table 30 below.

Table 30 - Targets for Air Quality

POLLUTANT	SOURCE	TYPE OF STANDARD	VALUE
Nitrogen dioxide	EU	Limit Value to protect health. 98 percentile of 1-hour means measured over a year	105 ppb
	UK	Health standard and objective to be achieved by 2005 1-hour mean	150 ppb
		Health standard and objective to be achieved by 2005 Annual mean	21 ppb
	WHO	Guideline to protect vegetation. 4-hour mean	50 ppb
		Guideline to protect sensitive plants Annual mean	16 ppb
		Guideline to protect sphagnum dominated vegetation Annual mean	6.2 ppb
Sulphur dioxide	EU	Limit Value to protect health 98 percentile of daily means measured over a year	131 ppb (with black smoke <128µg/m^3 (BS method))
	UK	Health standard for 15-minute mean and objective for 99.9 percentile of 15-minute means measured over a year, to be achieved by 2005	100 ppb
	WHO	Guideline to protect vegetation 24-hour mean	11 ppb
	UNECE	Critical level for lichen Annual mean	4 ppb
Black smoke	EU	Limit Value to protect health 98 percentile of daily means measured over a year	213µg/m^3 (measured by BS method)
PM_{10}	UK	Health standard for running 24-hour mean and objective for 99 percentile of highest daily running 24-hour means measured ove a year, to be achieved by 2005	50µg/m^3
Carbon monoxide	UK	Health standard and objective to be achieved by 2005 Running 8-hour mean	10 ppm
Ozone	UK	Health standard for running 8-hour mean and objective for 97 percentile of highest daily running 8-hour means measured over a year, to be achieved by 2005	50 ppb
Benzene	UK	Health standard and objective to be achieved by 2005 Annual mean	5 ppb
1,3 Butadiene	UK	Proposed specific objective for running annual mean, to be met by 2005	1ppb
Lead	EU	Limit Value for annual mean	2µg/m^3
	UK	Health standard and objective to be achieved by 2005 Annual mean	0.5µg/m^3

7.5.2 Discussion on the state of the air environment is incorporated within the section on controlled industrial processes in Chapter 6.

7.6 Fisheries

Fish Stocks

7.6.1 Although the Agency has a statutory duty to maintain, improve and develop fisheries, there are few targets or criteria against which fishery performance is assessed. The Agency intends to improve this situation. Egg deposition targets are being developed for salmon, but have not yet been adopted for sea trout. In any event, our level of knowledge of the status of stocks in the LEAP area streams is too poor to allow adoption of this approach in the foreseeable future. No stock target methodology has yet been developed for non-migratory trout or other freshwater fish. In the meantime, incomplete catch statistics and occasional juvenile fish surveys by electric fishing provide the only indicators of stock well-being and performance.

The EC Council Directive on the Quality of Fresh Waters Needing Protection or Improvement in Order to Support Fish Life (78/659/EEC).

7.6.2 This Directive lists appropriate water quality standards for salmonid and freshwater fish communities separately. Designated waters within the LEAP area are the Lymington River from 1.5km d/s of Whitley Bridge to the B3054 bridge at Lymington (5.3km) - sampling point Boldre Bridge; and the Beaulieu River from Kings Hat Enclosure to Beaulieu Mill Pond (4.5km) - sampling point Hartford Bridge. Both sites show full compliance.

Shellfish Water Quality and Hygiene

7.6.3 The situation regarding these two EC Directives is described in Section 6. The Shellfish Waters Directive sets the limits which represent a clear target, while adoption of a particular class (e.g. Class B) under the Hygiene Directive would also represent a target.

Chapter 8

The Environmental Issues to be Addressed

Shortfalls and other environmental problems are described as 'Issues', and options for their resolution are proposed for consultation.

CHAPTER 8: THE ENVIRONMENTAL ISSUES TO BE ADDRESSED

8.1 Major Issues

Issue No. M1. Excessive unlicensed surface water abstraction for trickle irrigation

Background

8.1.1 Trickle irrigation is an unlicensable activity and the Agency therefore has no powers to control or limit water abstraction for this purpose. However the Agency is supportive of the principle of trickle irrigation as it is inherently less consumptive than spray irrigation.

Effects

8.1.2 The abstraction of water for trickle irrigation can legally be undertaken without any regard for minimum river flow levels in streams and rivers. This can result in the reduction of already low summer flows, degrading existing licensed abstraction and the value of riparian and aquatic habitats for plant and animal communities and therefore affecting sea trout populations, directly affecting important species such as water vole, otter and sea trout populations.

Options for Action

8.1.3

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Introduction of legislation requiring licensing of trickle irrigation.	Increased control of summer abstraction rates. Protection of licensed abstractions.	Limitations on existing trickle irrigation abstraction.	None.
Do nothing.	No expenditure.	Increasing lack of control on summer abstraction rates.	Significant damage to riverine and aquatic habitats and biodiversity. Failure to fulfil conservation and BAP duties.

8.1.4 This is a national issue which needs to be addressed by new legislation. The New Forest LEAP area is one of the main areas in the country with a serious concern with regard to trickle irrigation. The Agency anticipates that legislation will be passed shortly to enable us to control this activity.

Issue No. M2, Clarification is required over the inter-relationship of powers and responsibilities between the Environment Agency and the Forestry Commission within the New Forest

Background

8.1.5 Within the LEAP area, the implications of Agency responsibilities in our operational, regulatory and advisory activities, especially concerning flood defence, are not yet fully developed. This is largely due to shared responsibilities and the possibility of conflicting objectives between different Competent Authorities. In particular, the Forestry Commission by virtue of its unique status as Manager of the Crown land within the LEAP area, has very specific responsibilities for drainage. These are laid down in the New Forest Acts of 1877, 1949, 1964 and 1970 and implemented through the Forestry Commission Management Plan of 1992.

8.1.6 Many of the duties of the Agency as set out in principle in the Environment Act 1995 and Land Drainage Act 1991, particularly in respect of flood defence, overlap with the responsibilities of the Forestry Commission. The Management Plan for the Crown lands is currently under review with the intention of full revision by the year 2000. There are opportunities for Agency dialogue with the Forestry Commission in the interim, in order to ensure that the Plan sets out strategies which are mutually beneficial to duties and responsibilities of both organisations.

Options for Action

8.1.7

OPTION	BENEFIT	DISBENEFIT / COST	RISK
The Agency will enter negotiations with the FC and others to ascertain the extent of respective responsibilities on Crown land.	Clarification of Agency responsibilities on Crown land. Reassurance that all Agency powers and duties are adequately covered. Integration of Agency and FC responsibilities to ensure maintenance of a favourable nature conservation status on Crown lands.	Financial and manpower costs of negotiations and subsequent commitment to the Agency role within the Forest.	The legislative hierarchy has yet to be tested, and until this happens there is a risk that the New Forest Acts may take precedence over the Environment Act with potential financial implications for the Agency.
Do nothing.	Low financial and manpower costs.	Continued uncertainty as to Agency responsibilities on Crown land.	Agency statutory duties may not be met. Conservation of the European importance of the Crown lands to nature conservation may be compromised.

Issue No. M3. Loss of biodiversity and the water resource associated with damage to valley mire systems

Background

8.1.8 The Crown Lands of the New Forest are acknowledged as wetlands of international importance through their designation as a Ramsar site. This places particular obligations on the Agency which is one of the principal organisations with responsibility for water levels. However, Agency responsibilities on the Crown Lands of the New Forest are not fully defined. [Issue No. M2].

8.1.9 The New Forest supports the largest mire resource in western Europe, although this is threatened by drainage of the mires themselves, and deepening of the streams into which they drain.

8.1.10 There is therefore a need to carry out a comprehensive review of Agency's regulatory and operational responsibilities within the LEAP area. Without definition of the extent of Agency responsibilities on the Crown Land of the New Forest, the extent of Agency responsibility for mire and stream restoration cannot be ascertained.

Effects

8.1.11 Damage to the mire systems has detrimentally affected mire plant communities, threatening the current levels of biodiversity in the Forest. Species of note that are adversely affected include the southern damselfly for which the Agency is the national and local BAP Contact. The mires' water holding capacity and smoothing of flood peaks are reduced, leading to greater extremes of low/flashy flows and to resource and water quality implications. The spreading scrub on mires and the cessation of alder coppicing have caused the loss of more species and therefore need to be addressed. Grazing is particularly important for these communities.

Options for Action

8.1.12

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Collaborate with others in restoration schemes at a level appropriate to Agency involvement.	Restoration of damaged habitat. Maintenance/increase in local biodiversity.	Manpower costs resulting from Agency contribution to restorative efforts.	None.
Evaluate success of restoration at a level appropriate to Agency involvement.	Establish success of restoration programme. Increase knowledge and experience of restorative schemes. Contribute to ecological data for the Crown Lands of the New Forest.	Manpower and financial costs.	None.
Do nothing.	None.	Continued drainage of mires. Retention of altered mires in damaged state.	Loss of habitat and biodiversity. Failure to comply with conservation and BAP obligations.

8.1.13 The Agency will support and contribute to the restoration of damaged mires and natural stream profiles within the Forest to a degree appropriate to the level of responsibility assumed by the Agency on Crown Lands.

8.1.14 The Agency will establish through the Hampshire Biodiversity Action Plan and by direct consultation with sources of biological data in the LEAP area, the damaged mire resource that occurs outside of the Crown land of the New Forest. Where damaged mires are identified, the Agency will consult with relevant bodies to ascertain their role in any restorative programme and contribute accordingly.

Issue No. M4. Loss of biodiversity associated with engineering works on natural river courses

Background

8.1.15 The majority of the New Forest streams have been engineered to increase their drainage capacity, through deepening and straightening of the watercourse, particularly in their middle reaches and near settlements. This has increased the efficiency of drainage throughout the catchment of the stream and has had profound and detrimental effects on habitat diversity of the streams, and the hydrological gradients of valley mires, fundamental to the diversity of plant and invertebrate species that are found within this habitat.

Effects

8.1.16 The increased drainage efficacy of New Forest streams has changed the hydrological regime of the area, and threatens the integrity of all wetland habitats. Streams, mires and permanent and ephemeral ponds are affected with subsequent loss of species diversity. Species that are adversely affected include the water vole, otter and native crayfish for which the Agency is the national and local BAP Contact. Additionally, stormwater falling within the upper reaches of the Forest streams flows more quickly out of the numerous tributaries into the principal arterial river, exposing the lower reaches to unnecessary extra flood risk.

Options for Action

8.1.17

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Contribution to restoration programme as appropriate.	Restoration of damaged watercourses. Maintenance/increase biodiversity.	Manpower costs resulting from the Agency's contribution nto restorative efforts.	None.
Monitoring of success of restoration at a level appropriate to Agency involvement.	Establish success of restoration programme. Increase knowledge and experience of restorative schemes. Contribute to ecological data for the Crown Lands of the New Forest.	Manpower and financial costs.	None.
Do nothing.	None.	Continued deepening of natural watercourses. Retention of altered watercourses in damaged state.	Loss of habitat and biodiversity. Failure to fulfil conservation and BAP duties.

8.1.18 The Agency will support and contribute to the restoration of natural stream profiles, with the back-filling of dredged watercourses, channel habitat enhancement schemes and the installation of weirs to a degree appropriate to the level of responsibility assumed by the Agency on Crown Lands.

Issue No. M5. Loss of biodiversity associated with recreational use of watercourses

Background

8.1.19 Riparian woodland is of Priority European conservation interest and is protected under the 1992 UK Habitats Directive.

8.1.20 Recreational pressures within the Forest are often focused on riparian habitats, which are of significant amenity value to the public.

Effects

8.1.21 Recreational pressures can cause significant ecological damage through erosive processes and disturbance. This problem manifests itself as loss of ground flora and marginal vegetation, with impacts on species diversity.

Options for Action

8.1.22

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Management of recreational activity through active or passive measures.	Reduction of recreational pressure on watercourses.	Manpower and financial costs for both active and passive control options.	Passive control risks the transferral of recreational pressures to other foci.
Enter negotiations with the FC to ascertain the role of the Agency in restorative programmes. Contribution to restoration programme as appropriate.	Restoration of damaged banks etc. Maintenance/increase in biodiversity.	Manpower costs appropriate to negotiations concerning the Agency's contribution to restorative efforts.	None.
Monitoring of success of restoration at a level appropriate to Agency involvement.	Establish success of restoration programme. Increase knowledge and experience of restorative schemes. Contribute to ecological data for the Crown Lands of the New Forest.	Manpower and financial costs.	None.
Do nothing.	None.	Continued damage to watercourses and associated habitat.	Loss of habitat and biodiversity.

8.1.23 The Agency has a duty to promote water-based recreation and will aim to do so in collaboration with the Forestry Commission, New Forest District Council, landowners and others where appropriate. Limitation of environmental damage will be achieved by visitor management which is seen as a preferable alternative to the wholesale reduction of recreational uses.

8.1.24 Strategies for reducing recreational impact may consider relocation of car-park and camping facilities to more robust habitats than is currently the case, and instigating appropriate restorative and management plans for riparian habitats damaged by current recreational use.

Issue No. M6. Limited knowledge on the nature of the water resource due to a lack of groundwater and surface water monitoring

Background

8.1.25 There is no major aquifer in the LEAP area and there is only one public water supply source from groundwater. Similarly, there are no major users in the LEAP area and no public water supply source from any rivers. Against this background there has been little resource monitoring network developed in the area, except for a gauging station on the River Lymington at Brockenhurst, constructed in 1966 and rebuilt in 1996, and an abstraction centre on the Walkford Brook and the Beaulieu River.

Effects

8.1.26 The public water supply at Ampress abstracts from a confined aquifer. The Agency has no facilities with which to determine the zone of influence of the borehole and hence appropriate groundwater protection zones. Groundwater protection zones enable the Agency to restrict and control potentially contaminating activities around public water supply boreholes. Additionally, because there is no groundwater monitoring the Agency is unable to establish whether groundwater abstraction is affecting any riverine or aquatic habitats by reducing stream flow levels or by lowering groundwater levels in the valley mires. Groundwater monitoring in the LEAP area will give us a greater understanding as to the main factors that influence river flows and water levels in the valley mires.

8.1.27 River flow rates and levels are heavily influenced by the historical drainage of valley mires and by abstraction for irrigation in the southern coastal belt. The Agency needs further continuous river flow monitoring and control facilities so as to be able to more closely control and monitor the effect of summer abstraction for spray irrigation on river flows.

Options for Action

8.1.28

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Installation of full regional groundwater monitoring network.	Increased knowledge of extent of various groundwater units.	Very expensive to drill and install, £5,000+/ borehole. Ongoing monitoring required.	Danger of collecting inconclusive information.
Installation of monitoring boreholes around the Ampress abstraction.	Full quantification of the resource. Further development of a possibly under utilised resource.	Expensive to drill and install. Ongoing monitoring required.	
Installation of monitoring boreholes around one specific and significant valley mire.	Full understanding of the hydrogeological mechanisms affecting valley mires. Development of a model of mire development to be used to assess further abstractions from small aquifers.	Unit installation cost may be relatively cheaper than full regional network if only shallow boreholes required.	Investigation may be inconclusive.
Establishment of flow monitoring on the smaller New Forest streams and rivers.	Monitoring of low summer flow rates. Identification of over abstraction by trickle irrigation. Identification of Minimum River Flows (MRFs) consistent with needs of abstractors and needs of environment will facilitate development of BAPs.	Cost of installation £5 - 25k.	
Do nothing.	No cost.	No further understanding of groundwater and surface water mechanisms sustaining wetland habitats. No assessment of whether the Ampress source is underdeveloped.	No basis for refusing applications to abstract from minor aquifers. Failure to facilitate BAPs. Failure to fulfil conservation duties.

Issue No. M7. Low summer flow rates in certain New Forest streams

Background

8.1.29 To reduce demand for spray irrigation from the New Forest streams in the summer months, opportunities must be taken to reduce or revoke Licences or Right. The DETR review of the abstraction licensing system will consider the issue of compensation for revoked licences.

8.1.30 Any new spray irrigation licences will only be permitted if winter storage is provided. These winter abstractions will be linked to minimum river flow conditions.

Effects

8.1.31 Low flows in rivers are often accompanied by serious deterioration in water quality with detrimental effects on the riverine habitat and fish stocks.

Options for Action

8.1.32

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Reduce or revoke existing licences.	Reduction in demand from New Forest streams. Increased summer flows and maintenance of water quality standards.	Compensation to licence holder.	None.
Adopt a more ecological basis for setting MRF.	More efficient demonstrable approach to MRF.	Short-term cost.	Loss of unquantified biodiversity.
Do nothing.		Continued derogation at low flows in New Forest streams.	Damage to wetlands and streams.

8.1.33 The Agency intends to regulate and maintain basal flows on the Danes Stream, Plummers Water, the Beaulieu River, Dark Water, Stanswood Stream and Sowley Stream by the erection of minimum flow weirs. The DETR review of the abstraction licensing system will consider the issue of compensation for revoked licences.

Issue No. M8, Reduced stream water quality during summer low flow

Background

8.1.34 The New Forest rivers and streams are susceptible to low flows, especially in the summer months. At times of low flows any effluent discharges to streams will have a strong influence on the river water quality. For instance the effluent discharge from Brockenhurst WWTW probably contributes to more than 50% of the flow in the Lymington River at Brockenhurst during very low flow periods.

Effects

8.1.35 The effluent discharges from waste water treatment works during low flow periods can lead to eutrophic conditions in the rivers due to the higher levels of BOD and nutrients. There will also be corresponding high levels of faecal coliforms. Many New Forest rivers are used for bathing by visitors and, although the rivers are not designated bathing waters, the Agency is concerned that these waters may not be suitable for bathing. Eutrophication will also compromise the naturally nutrient-poor status of the New Forest rivers with implications for the ecology and diversity of the watercourses.

8.1.36 *Options for Action*

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Tertiary treatments	Reduction of coliforms released to receiving waters. Reduction of risk of summer eutrophication and fish kills. Reedbeds would create new wetland habitats.	Cost and energy requirements.	None.
Review consents where appropriate to improve effluent discharge quality.	Improved effluent discharge quality.	None - cost borne by discharger.	
Do nothing.	None.		Risk of poor water quality during summer low flows and attendant stress on the riverine biodiversity. Failure to fulfil conservation and BAP duties. Failure to meet River SSSI conservation strategy objectives.

8.1.37 Reed beds or constructed wetlands are suitable for polishing waste waters which require a high standard of nutrient removal. However, they are not the only method of reducing levels of nutrients which may result in eutrophication of waters. In the UK, water companies are using technologies of biological nutrient removal systems, where necessary, to meet the requirements of the Urban Waste Water Treatment Directive.

8.1.38 Constructed wetlands are also efficient at retaining suspended solids, metals and micro-bacteria. However, reed beds are also an attractive feature and a habitat for conservation and biodiversity within the forest environment. Therefore, where there is a benefit to the environment, the Agency will encourage the use of constructed wetlands.

Issue No. M9. Disruption of stream ecology and processes due to the removal of debris dams from New Forest watercourses

Background

8.1.39 Debris dams form when woody material becomes trapped within the channel of a watercourse. This acts as an impediment to the passage of other debris, so resulting in an accumulation of material which can serve to dam the stream in which it has formed. Debris dams are very important to the ecology of the New Forest streams, diversifying opportunities for habitats and communities and supporting a range of specialist invertebrate fauna. They are the means by which a river restores its natural form, encouraging pools, riffles and meanders to re-establish in formerly dredged waters. The dams also hold back flood waters, reducing peak flows. Those which present total blockages may prevent the migration of sea trout. Flooding within the New Forest is vital to the ecology of the riparian woodlands, a Priority 1 habitat under the Habitats Directive.

Effects

8.1.40 Debris dams are frequently removed because of the localised flooding and the impediment to water flow that can result. This causes the loss of habitat diversity associated with the dams and a subsequent loss of specialised invertebrate faunas including the native crayfish that make an important contribution to biodiversity within the area of the New Forest LEAP. The material re-creation of pools, riffles and meanders is prevented and, during times of peak run-off, lower reaches of arterial rivers are exposed to unnecessary extra flood risk as a direct result of decreased land drainage response times.

8.1.41 *Options for Action*

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Retain all debris dams unless they constitute a flood risk to property.	Reduction in financial and manpower commitments. Enhanced stream and riparian habitat.	Conflict with interest groups.	Increased risk of localised flooding.
Enter into talks with the FC and all other relevant parties to negotiate and agree a policy of reduced intervention	Reduction in financial and manpower commitments. Enhanced stream and riparian habitat.	Time and manpower costs associated with negotiations.	Increased risk of localised flooding.
Do nothing.	Reduction in conflict.	Debris dams will continue to be removed on the basis of a 1-5 rating. Financial costs of removal Time and manpower.	Loss of biodiversity. Conflict of options. Failure to fulfil statutory BAP duties.

8.1.42 There is a need to prepare criteria for the management of debris dams in New Forest streams, after due consideration is given to the conflicting interests. The Agency will contribute to a review of the cyclical, phased or strategic management of debris dams and liaison with the Forestry Commission, English Nature, commoners and angling interests will be sought. These matters will also be addressed as part of the Flood Defence function's maintenance management programme.

Issue No. M10. Reduced recreational water quality at Calshot

Background

8.1.43 Ashlett Creek Waste Water Treatment Works is located just north of Calshot on Southampton Water. Currently treatment is limited to preliminary treatment followed by discharge.

Effects

8.1.44 Elevated levels of faecal and total coliforms have been recorded at the nearby Recreational Beach.

Options for Action

8.1.45

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Construction of a primary and secondary treatment facility at the existing site.	Compliance of WWTW discharge with Urban Waste Water Directive. Improved water quality at Calshot.	None.	None.
Do nothing.	None.	Non-compliance with the EC Urban Waste Water Treatment Directive. Reduced water quality at Calshot water sports recreation facility.	No improvement to the water quality. Failure to fulfil recreation and conservation duties.

8.1.46 Under the EC Urban Waste Water Directive, Southern Water Services must improve Ashlett Creek WWTW to meet the requirements of this Directive. It is proposed to build a primary and secondary treatment facility on the existing site. The Agency will ensure that, through consenting procedure, these standards are met.

Issue No. M11. Derogation of the Keyhaven Pond at the Lymington and Keyhaven Nature Reserve

Background

8.1.47 Keyhaven Marshes are an important coastal nature reserve with a mix of freshwater, brackish and saline habitats. Parts of the area are candidate Special Areas of Conservation, Special Protection Areas and a proposed wetland of international importance under the Ramsar Convention. These habitats are vulnerable to changes in groundwater and surface water conditions and in the scale, location and frequency of inundation by the sea. In the past 30 years, gravel has been extracted from adjoining land at Manor Farm, Pennington, and the voids have been filled with waste. Originally, the waste disposal operations were carried out on a dilute and disperse basis which caused some localised leachate problems, although the marshes were rarely affected. More recently, deposited waste has been contained in clay lined cells designed to prevent the dispersion of contaminated water. In the early 1990s, a new sea wall was constructed along the edge of the marshes to protect them from high tides. The brackish habitats were originally salt pans, drained and used for rough grazing. Remaining saline lagoons on the landward side of the sea wall are important habitats for starlet anemones (*Nematostella vectensis*).

Effects

8.1.48 In recent years Keyhaven Marshes appear to have suffered some adverse changes in the environment, the most significant of which relates to the reduction in the salinity of Keyhaven Pond. A recent study has shown that this is due to:-

- excessive input of freshwater from the dewatering of the adjoining gravel workings; and
- reduced inundation by seawater due to the new sea wall.

8.1.49 These changes have threatened the highly specialised invertebrate fauna (starlet anemones in Keyhaven Pond) and the site's potential status as part of the candidate Solent Lagoons SAC. Other changes in the marshes environment, which may be due to the gravel extraction and tipping operations at Manor Farm, are being examined as part of a comprehensive study which is nearing completion.

Options for Action

8.1.50

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Management of sluices within the sea wall.	Increased inundation by seawater. Re-establishment of balance in brackish water habitat.	Management costs.	
Rerouting of existing discharge from gravel workings away from saline ponds.	Re-establishment of salinity balance in the marsh habitat. Reduction of total suspended solid and iron loading in marsh environment.	None. Although the alternative point of discharge should be carefully chosen to avoid repetition of the problem elsewhere.	
Further monitoring and assessment of the marsh environment.	The best remedial action can be identified.	Further delays and costs.	Delay will ultimately lead to irreversible damage to the marsh environment.
Do nothing.	None.		Failure to comply with statutory duties

8.1.51 The Agency, English Nature and Hampshire County Council are conducting a number of major investigations into the Marsh and the surrounding area to better understand the hydrological and hydrogeological conditions. The results of these will be available soon and appropriate actions may include the actions detailed above.

Issue No. M12, Continuing prohibition of shellfish production in the vicinity of the current Pennington WWTW outfall

Background

8.1.52 Pennington Waste Water Treatment Works are located close to the gravel extraction and landfilling operations at Efford. Historically the treatment consisted of preliminary treatment followed by a discharge to sea in the sub-tidal zone. In March 1997 a full secondary treatment plant was made operational and the quality of the discharge significantly improved to satisfy requirements of the EC Urban Waste Water Treatment Directive. The waters into which the treatment works discharges are an important potential area for the natural production and holding of shellfish. Improving the initial dilution of the discharge will benefit water quality for the production and holding of shellfish. An option for achieving this is the extension of the long sea outfall.

Effects

8.1.53 The discharge has resulted in the prohibition of the harvesting of shellfish There are high levels of faecal coliforms and this contravenes the EC Shellfish Hygiene Directive.

Options for Action

8.1.54

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Extend point of discharge further into the Solent.	Increased dilution at the point of discharge. May lead to improvement of shell fishery.	No disbenefit. Cost borne by water company.	
Do nothing.	None.	No improvement of shellfish waters.	Failure to fulfil conservation obligations.

Issue No. M13. Improved management of urban and agricultural surface water run-off

Background

8.1.55 Historically, excess surface water after heavy rainfall has been transmitted direct to river systems via ditches and culverts.

Effects

8.1.56 Excess surface water directly channelled into river systems can cause rapid overloading and exceedance of the river systems capacity. Urban run-off will also reduce the quality of the river waters through raised COD, metals and oil contents. Rapid agricultural run-off introduces large amounts of silt into river systems which can severely degrade the riverine habitat and biodiversity. Poor quality of river waters has been identified in Langdown Stream, Ashley Stream, Walkford Brook and Becton Bunny and this may well be due to urban run-off.

Options for Action

8.1.57

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Development of surface water retention features, promoting appropriate agri-environmental solutions.	Improved management of water resources. Creation of wetland habitats.	Land and financial requirement.	
Do nothing.	None.	No improvement in urban river water quality. No enhancement of base flow rates and summer flow rates.	Urban flooding after storm rainfall events.

8.1.58 The Agency has a policy to encourage the retention of surface water run-off in suitable shallow holding features. These include long shallow ditches (swales), scrapes, reed beds and balancing lagoons. Buffer strips and appropriate riparian vegetation management are also encouraged and the Agency will promote agri-environmental solutions where appropriate. The Agency has a policy to actively promote these more environmentally sympathetic systems of water and riparian land management where clear environmental benefits may be identified.

Issue No. M14. Development of the Flood Defence Management System (FDMS)

Background

8.1.59 The Agency's present understanding of flood related issues is summarised within the various Section 24 maps. These maps primarily provide us with both historical and conjectural flood events based upon a 1:50 year event frequency. These plans are used to compile lists of maintenance and capital works to meet the expectations of the public.

Effects

8.1.60 Owing to urban intensification. historic flood defences are in some places at risk from overtopping. In some instances urban growth has resulted with the Agency's flood defence services being more reactive than proactive.

Options for Action

8.1.61

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Expand Flood Warning Dissemination Service.	Increased flood warning capability. Improved public perception of Agency.	No disbenefits, however the Agency will be required to allocate appropriate funding and resources to develop a fully integrated FDMS process.	None.
Do nothing.	None.		Poorly co-ordinated and slow responses to assist areas affected by localised flooding.

8.1.62 In response to Section 105 of the Water Resources Act 1991, the Agency is statutorily required to exercise a general supervision over all flood defence matters, with powers and duties largely relating to Main Rivers and to sea defence works. Principal concerns are:-

- the natural catchment area of watercourses and rivers;
- the channels occupied by rivers and watercourses during times of normal flow;
- flood plains and washlands which accommodate water during periods of flood; and
- coastal flood plains at risk from flooding from the sea or tidal lengths of rivers, whether or not protected by sea defences.

8.1.63 In response to this legislation, the Agency has embarked upon an exercise of updating its knowledge and understanding of the natural environment with respect to flood issues, a process culminating with the introduction of an integrated flood defence management process for targeting and prioritising both capital and maintenance works.

8.1.64 We believe that this system will become a multidisciplinary management tool used for a wide range of functions ranging from providing proactive planning advice to local authorities, to targeting capital works at sensitive river reaches.

Issue No. M15. The impact of sea level rise on intertidal areas (coastal squeeze)

Background

8.1.65 Climatic conditions are changing. Increasing storm severity, coupled with rising sea levels, exposes coastal zones to the risk of flooding. Extensive areas of the New Forest LEAP coastal zone between the Dorset border and Calshot are below high tide level. Subsequently defences of varying construction, ownership and responsibility have been constructed around this coastal zone. Sea defences are operated and maintained by the Agency, local authorities and/or private landowners. Where sea walls protect grazing marshes and low-lying housing from flooding by the sea, rising sea levels are squeezing the intertidal habitat caught by the sea wall, preventing the natural retreat of the habitat up the shore. The threatened intertidal habitat is protected under both the 1979 Birds Directive and the 1992 UK Habitats Directive and there is therefore an obligation on the Agency to retain a favourable conservation status for this habitat. However, the Agency also has functions relating to coastal flood defence, and there is therefore a conflict of interest between obligations under European Directives with specific conservation objectives, and coastal flood defence within the New Forest LEAP area.

Effects

8.1.66 The construction of sea defences has resulted in a conflict of interests between flood defence, fisheries and conservation issues in so far as that rising sea levels will eventually drown intertidal habitats lying immediately in front of the sea walls. Additionally, the erection of flood defence structures across river outlets has implications for the migration of sea trout. Furthermore, continuing sea level rises will eventually expose the existing sea defence to the risk of overtopping.

8.1.67 *Options for Action*

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Adopt a policy of natural retreat	Conservation of intertidal habitats.	Low cost.	Exposes land and properties to risk of flooding and which will be ultimately lost through either erosion or submergence.
Adopt a policy of holding the line	Protection of land and properties upon coastal zone.	Requires extensive manpower and high capital commitment.	Loss of intertidal habitats.
Do nothing.	None.	Loss of intertidal habitats.	Unmanaged risk to all.

8.1.68 In addition to undertaking general maintenance and upgrading works, we can build new defences. New developments are nowadays only undertaken to protect built-up areas from flooding and we ensure that they are technically, economically and environmentally sound. However, we acknowledge that it is inappropriate to attempt to contain or interfere with natural processes which are beyond both our financial resources or present comprehension. We will therefore continue to develop our

understanding of the implications of these changes and how the resultant natural processes effect our built environment, thus enabling us to co-ordinate our capital works and maintenance programme more efficiently. .

Issue No. M16, Inadequate understanding of the effect of acid deposition on ecology of the New Forest

Background

8.1.69 National studies have identified some of the soils in the LEAP area as being particularly sensitive to acid deposition. There are major industrial sources of sulphur dioxide emissions in the LEAP area that will be making a contribution to acid deposition in the locality. There is, however, no information on either the contribution being made by local sources to acid deposition, nor on the significance of the deposition to sensitive soils, flora and fauna of the New Forest.

Effects

8.1.70 Acid deposition is in excess of the critical loads in the New Forest area and it may therefore be having an effect on the ecology. However, there is no specific information on the potential effects of the acid deposition on the area, so it is not possible to monitor the improvement that might be expected as sulphur dioxide emissions are reduced, nor to establish whether further emissions reductions may be required.

Options for Action

8.1.71

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Desk Study. Covering deposition and effects.	Information on contribution of industrial emissions to local deposition and significance for ecosystem. Will identify any need for further emission controls.	£10 - 20k.	None.
Do nothing.	No financial cost.	Uncertainty as to role of industrial emissions, and potential need for further emission controls.	Possible damage to the environment, due to emissions, may continue. Failure to fulfil conservation and BAP duties.

8.1.72 It would be helpful to identify the contribution made by emissions in the area to the local deposition, as well as to identify the significance of the deposition in the area in terms of its effects on the ecosystem in those areas where the critical load for sulphur deposition is exceeded. The Agency proposes to commission a desk top study of these issues.

Issue No. M17. Inadequate understanding of the impact of sulphur dioxide emissions

Background

8.1.73 There is a new air quality standard in the UK for sulphur dioxide exposure over a 15-minute period. Several of the Part A processes authorised by the Agency in the LEAP area are important emitters of sulphur dioxide.

Effects

8.1.74 To protect human health, exposure to sulphur dioxide should not exceed the newly defined air quality standard of 100 ppb over 15 minutes. The Government's objective is to meet this standard as a 99.9 percentile by 2005. Currently the Agency has no information on whether or not the objective is being exceeded in the LEAP area and the extent to which Part A processes may be contributing, and therefore whether further control measures will be required to meet the objective by 2005.

Options for Action

8.1.75

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Modelling for 15-min sulphur dioxide.	Indication of whether the national air quality objective is being exceeded and where, as well as which sources are important. Identify need for further controls on emissions.	Models are only indicative of a problem. £10-20k.	May suggest no problem when in fact there is one. May suggest a problem when in fact there is not one.
Monitoring for 15-min sulph dioxide.	Firm evidence of exceedance of national air quality standard and likely need for further controls on emissions.	Cannot monitor everywhere. Levels vary from year to year. Unsure as to source of elevated concentrations. £50 - 100k.	May not monitor where problem is. May not monitor at time of peak concentration.
Modelling and monitoring for 15-min sulphur dioxide.	Optimum approach as modelling indicates if and where problems occur, monitoring confirms findings.	£50 - 100k.	As above, but less risk.
Do nothing.	No financial cost.	Uncertainty as to need to further regulate emissions	Possible harm to health due to exceedance of national air quality standard.

8.1.76 The Agency proposes to ensure that the operators of the authorised processes carry out an assessment of the impact of their sources in relation to the new standard, initially by modelling and then if appropriate by monitoring. It is proposed that this assessment should be co-ordinated by the Agency to ensure that the combined effect of the various sources in the area are taken into account.

Issue No. M18, Inadequate understanding of the combined impacts of process emissions

Background

8.1.77 There are a number of authorised Part A processes in close proximity to each other that emit the same pollutants. To date, these emissions have been assessed in isolation.

Effects

8.1.78 The combined impact of the industrial emissions may be more significant than their individual impacts.

Options for Action

8.1.79

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Monitoring. Focus on nitrogen dioxide and sulphur dioxide, short and long-term impacts.	Firm evidence of actual combined impacts and need for further controls on emissions.	Cannot monitor everywhere. Levels vary from year to year. Unsure as to source of elevated concentrations. Cannot consider combined impact of existing and new sources. £50 - 100k	May not monitor where problem is. May not monitor at time of peak concentration.
Modelling. Focus on nitrogen dioxide and sulphur dioxide, short and long-term impacts.	Indication of combined impact and need for further controls on emissions.	Models are only indicative of a problem. £10 - 20k	May suggest no problem when in fact there is one. May suggest a problem when in fact there is not one.
Do nothing	No financial cost	Uncertainty as to need to further regulate emissions.	Possible harm to health due to exceedance of national air quality standard.

8.1.80 The Agency proposes to seek to establish a co-operative exercise between the local industries to determine the significance of the combined impact of their emissions on the surrounding area, both in relation to long-term average and short-term peak concentrations. It is proposed that this exercise should initially focus on sulphur dioxide and nitrogen dioxide.

Issue No. M19, Public concern over odour control at industrial sites

Background

8.1.81 Odours give rise to one of the largest areas of public concern about industrial operations.

Effects

8.1.82 The industrial operations in the LEAP area give rise to complaints about odour. The number of complaints is not excessive in relation to those received in general by the local authority across the whole of the LEAP area. They are, though, predominantly related to one facility.

Options for Action

8.1.83

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Work with industry to develop further strategy to tackle odours.	Reduction in disamenity and complaints.	Cost in Inspector's time.	None.
Do nothing.		Continued nuisance for local residents. Inspector's time.	Reduced quality of life. Complaints will continue. Will take up Inspector's time.

8.1.84 The Agency will work closely with the industry concerned to develop further its strategy for tackling odours, in particular those associated with fugitive emissions.

Issue No. M20. Status of sea trout population is unknown

Background

8.1.85 Knowledge of sea trout populations in the New Forest is scarce. Reported catches of sea trout have been lower in recent years than formerly, especially in the Lymington River.

Options for Action

8.1.86

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Investigate levels of sea trout stocks.	Identification of impacting processes.	Manpower and cost implications.	None perceived.
Remediate the identified cases where possible.	Reliable future management of sea trout population.	Inappropriate until causes are identified.	
Do nothing.	None.	Loss of fishing and fish stocks.	Failure to fulfil fisheries and conservation duties.

8.1.87 To facilitate longer-term assessment of the status of sea trout stocks, strategic fish surveys will be repeated. A Sea Trout Action Plan, prepared by the Agency, will then follow. A fish counter has already been deployed on the Lymington River in the summer of 1997.

Issue No. M21. Obstructions to free passage of sea trout

Background

8.1.88 Agency assessments of potential obstructions to sea trout migrations in streams within the LEAP area have revealed that certain conditions of river flow and/or tidal height produce significant obstructions to migration.

Options for Action

8.1.89

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Remedial - incorporate improvements as opportunity arises.	Gradual improvement in situation.	Unsatisfactory situation will be maintained in the short-term.	
Remedial - rebuild all problem structures.	Immediate solution to problem.	Very high financial cost.	Costs not justified by improvements in fish passage.
Do nothing.		Unsatisfactory fish passage situation will continue.	Fish stock will perform below potential. Failure to fulfil fisheries and conservation duties.

Issue No. M22, Poaching pressure on sea trout stocks

Background

8.1.90 Illegal exploitation of sea trout on the Lymington River, Beaulieu River and Avon Water is a major concern to the Agency since it is a potentially significant impact on the adult sea trout spawning in the New Forest streams.

Options for Action

8.1.91

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Maintain anti-poaching activities.	Protection of sea trout population.	Manpower costs.	None.
Work with public organisations for intelligence purposes.	More efficient targeting of anti-poaching effort. Deterrent effect.	Additional publicity and liaison costs.	Wasted resources.
Seek to maximise penalties for environmental offences.	Additional deterrent.	Additional manpower and administration costs.	
Do nothing.		Poaching will continue.	Major losses of stocks of fish.

8.2 Subsidiary Issues

Issue No. S1. Implications of the Habitats Directive on the Agency

Background

8.2.1 The Hampshire and Isle of Wight Area of the Environment Agency stands out over other Agency areas as having a disproportionate number and area of European-designated conservation sites.

8.2.2 As a result of the 1992 EU Habitats Directive, the New Forest SSSI has been submitted to the EU as a candidate Special Area of Conservation (cSAC), important for a number of habitat types and species of European Interest and European Priority Interest. The Directive has also resulted in the submission of the Solent and Isle of Wight Lagoons cSAC to the EU and the large majority of the marine and intertidal areas of the LEAP area is proposed as a possible cSAC.

8.2.3 In addition to sites protected under the 1992 Habitats Directive, the Crown Lands of the New Forest are designated a Ramsar site and a SPA under the 1971 Convention on Wetlands of International Importance and the 1979 Birds Directive respectively. In the coastal zone, much of the intertidal area is also included within the proposed Solent & Southampton Water SPA.

8.2.4 The Habitats Directive, through the Habitats Regulations and PPG9, invests a number of responsibilities on the Agency as a 'Competent Authority' in all its capacities as an operator, regulator and influencer.

Options for Action

8.2.5

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Agency continues to work with English Nature and other Competent Authorities to ensure compliance with the Habitats Directive in all its operational, regulatory and advisory functions.	Fulfilment of role as Competent Authority. Accordance with statutory duties.	Large manpower and resource implications where 'no new resources' are allocated.	
Do nothing.	Low manpower costs.	Less well defined environmental management system.	Favourable nature conservation status of sites protected under European legislation may be compromised.

8.2.6 The Agency will continue to train staff and raise internal awareness of the implications of the Habitats Directive, will continue to liaise with English Nature and other 'Competent Authorities' to improve consultation procedures and will aim to fulfil all its various responsibilities as an operator, regulator and influencer under the Habitats Regulations and PPG9 in the LEAP area.

Issue No. S2, Fulfilling the Agency's biodiversity commitment

Background

8.2.7 The New Forest LEAP area includes a nature conservation resource of significance in a European context. This resource is under constant pressure from recreation, agricultural practices, industry, New Forest settlements and past inappropriate management, causing damage to fragile wetlands and localised losses of biodiversity.

8.2.8 The UK Steering Group Report (Anon, 1995) lists four key species of national conservation concern that occur in the New Forest, for which the Agency is the Contact point. There are nine other species and 13 other habitats for which the Agency has other responsibilities in the New Forest area.

Options for Action

8.2.9

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Initiate consultations with other relevant organisations to ensure the delivery and implementation of Species and Habitat Action Plans.	Coherent and informed conservation strategy for threatened species.	Financial and manpower costs for both consultations and implementation of Species and Habitat Action Plans where no resources have been allocated.	None.
Monitoring of species populations.	Establish success of conservation strategy. Increase knowledge and experience of conservation of particular species. Contribute to ecological data for the LEAP area.	Substantial financial and manpower costs.	None.
Do nothing.		Obligations of the Agency to the Biodiversity Action Plan would not be met. No coherent nature conservation strategy for targeted species.	Further declines in species for which the Agency is the Contact point. Failure to fulfil BAP and conservation duties.

8.2.10 The Agency will support the Hampshire Biodiversity Action Plan Partnership to deliver and implement Species and Habitat Action Plans across the county. Within the New Forest LEAP area, the Agency will take a lead in purchasing plans for the water vole, otter, crayfish and southern damselfly and will support partners in producing and implementing plans for other species and habitats for which it shares some responsibility. We will aim to demonstrate best practice in fulfilling all our functions towards biodiversity in the LEAP area.

Issue No. S3. Loss of biodiversity associated with deepening of ephemeral water bodies

Background

8.2.11 A number of ephemeral water bodies away from the Forest watercourses have been damaged by deepening, often undertaken to create a more permanent water feature, of enhanced amenity value.

Effects

8.2.12 Deepening of some ephemeral waterbodies has resulted in habitat loss for the very specialised faunal communities that exploit this habitat type, with subsequent impacts on biodiversity.

Options for Action

8.2.13

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Enter negotiations with the FC to ascertain the role of the Agency in restorative programmes. Contribution to restoration programme as appropriate.	Restoration of damaged ephemeral pools. Maintenance/increase in biodiversity.	Manpower costs appropriate to negotiations concerning the Agency's contribution to restorative efforts.	None.
Monitoring of success of restoration at a level appropriate to Agency involvement.	Establish success of restoration programme. Increase knowledge and experience of restorative schemes. Contribute to ecological data for the Crown Lands of the New Forest.	Manpower and financial costs.	None.
Do nothing.	None.	Continued loss of ephemeral water bodies.	Loss of habitat and biodiversity.

8.2.14 The Agency will support and contribute to the restoration of damaged ephemeral ponds within the Forest to a degree appropriate to the level of responsibility assumed by the Agency on Crown Lands.

Issue No. S4. The threat to aquatic ecology of New Forest watercourses caused by the spread of alien flora and fauna

Background

8.2.15 The aquatic ecology of many of the New Forest water courses and the marine and intertidal ecology of the coastal zone is threatened by the spread of exotic alien plant species that can cause profound changes with the respective ecosystems. The spread of American mink and signal crayfish is thought to be impacting on native species such as the water vole and native crayfish. The eventual dominance of alien species within an ecosystem results in a significant decline in biodiversity.

Effects

8.2.16 Biodiversity within the New Forest LEAP area is threatened by the spread of alien species.

Options for Action

8.2.17

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Do nothing.	None.	Alien species will continue to spread throughout the LEAP area.	Loss of biodiversity. Failure to fulfil conservation and BAP duties.
Control invasive species where they threaten aquatic, marine or intertidal ecosystems wherever other Agency work is taking place.	Conservation of aquatic, marine and intertidal ecosystems.	Manpower and financial costs.	None.

8.2.18 The Agency will try to conserve biodiversity by contributing to the control of invasive species where they threaten aquatic, marine or intertidal ecosystems. Control of these species and advice to landowners will occur wherever other Agency work is taking place.

Issue No. S5. Reduced nature conservation value of Lymington Reed Beds SSSI

Background

8.2.19 Historically, there was some concern that the Lymington Reed Beds SSSI was undergoing a decline in reed quality as a result of inefficient tidal flaps at the mouth of the River Lymington. This has permitted water to back up, flooding the reed beds and making them too wet for harvest for thatching purposes.

Effects

8.2.20 The nature conservation value of the Lymington Reedbeds SSSI suffered a decline through on-site accumulation of reed biomass, with the increase in wet biomass possibly suppressing invertebrate levels, which in turn subsequently impacted upon important bird species dependent upon the reed-bed habitat.

Options for Action

8.2.21

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Review water management with respect to the SSSI.	Identify factors affecting reed quality.	Financial and manpower commitments.	Possible that not all influencing factors would be identified.
Consult with EN and HWT to produce a restoration strategy. Contribute as appropriate.	Restoration of nature conservation value of reed beds.	Financial and manpower commitments.	None.
Do nothing.	No anticipated financial commitments.	Further declines in reed quality with subsequent effects on the habitat value of the reed beds.	Loss of biodiversity. Failure to fulfil conservation and BAP duties. Failure to meet WMLP recommendations.

8.2.22 In response to this recognised decline, the Agency instigated the preparation of a Water Level Management Plan and, in association with English Nature and the Hampshire Wildlife Trust, devised a strategy to restore the nature conservation value of the reed bed. This included installing new structures at the mouth of the river and although the ecological quality of the SSSI is now improving, we will continue to monitor its recovery and performance.

Issue No. S6, Groundwater contamination at Ampress Works public water supply

Background

8.2.23 There are two aquifers from which groundwater has been extracted for public water supply at Ampress works just north of Lymington. The shallow, near surface aquifer has been contaminated by metals and solvents arising from old industrial works adjacent to the site. Public water supplies are now only abstracted from the deep aquifer.

Effects

8.2.24 We are monitoring the Passford Brook, which runs by the site, regularly and there is no evidence of the river becoming contaminated by polluted groundwater from the shallow aquifer.

Options for Action

8.2.25

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Remediate by removal of contaminated ground.	Removal of contaminants.	Very expensive.	May not remove all contamination.
Installation of groundwater migration barrier.	Reduced possibility of migration of contamination to Passford Brook.	Will not enable utilisation of groundwater resource. Very expensive.	May not be wholly effective.
Do nothing.		No utilisation of groundwater resource.	Possibility of migration of contamination to Passford Brook.

Issue No. S7, The control and maintenance of privately owned flood defence structures

Background

8.2.26 Privately owned structures are common on watercourses for a variety of traditional water uses, such as operation of mills, creation of navigation channels and fish farming and amenity. By law, these must be maintained and operated properly by their owners if they affect river levels and flows. Privately owned structures also exist at certain coastal locations.

Effects

8.2.27 The general condition and the independent operation of privately owned structures can be of considerable concern with respect to how the Agency manages matters associated with river flows and flood defence.

Options for Action

8.2.28

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Introduce WLMP.	Private owners agree to maintain and operate structures in accordance with WLMP.	Minimal costs, problem structures identified.	Financial and manpower commitments
Seek the introduction of new legislative powers to mandatorily 'adopt' all essential structures within private ownership.	Increased ability to co-ordinate flood defence matters over large geographic areas.	Capital costs for renewing/ maintaining structures.	None.
Do nothing.	None.	Indirect maintenance cost requirements as a result of flooding to localised properties.	Reduced ability to co-ordinate flood defence matters. Loss of public credibility. Failure to fulfil conservation and BAP duties.

8.2.29 With respect to taking a proactive role in managing river water levels and flows, the Agency has initiated the preparation of Water Level Management Plans (WLMPs). Presently these are principally targeted at SSSIs and other areas of high ecological or landscape importance. To date a WLMP for the lower reaches of the Lymington River has been completed. WLMPs pertaining to stretches of the Pennington and Keyhaven Marshes are presently under consideration and the Agency will continue to promote the development of these and other plans.

8.2.30 Parallel to these works, the Agency will seek to instigate appropriate legislation which enables it to increase its authority and control over privately owned structures, thus ensuring that they are maintained and operated to the common good of ecological and flood defence issues.

Issue No. S8. Defining the role of the Agency in local air quality management

Background

8.2.31 The Environment Act 1995 has given local authorities new responsibilities for managing air quality in their area. The Agency has agreed to work closely with the local authorities, helping them carry out their reviews and prepare an action plan if necessary.

Effects

8.2.32 There are a number of industrial sources under the control of the Agency that will need to be considered by the New Forest District Council when it carries out its local air quality management functions. Information on the emissions from these sources and their impact on local air quality will be sought by the local authority.

Options for Action

8.2.33

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Develop links with New Forest DC and supply relevant information.	More informed local air quality review.	Greater input of Inspector's time.	None.
Encourage local industries to assist by monitoring impact of emissions.	More informed local air quality review.	None.	None.
Do minimum.	None.	Less influence on process and outcome.	Pressures may arise to introduce different priorities for dealing with industrial emissions.

8.2.34 The Agency proposes to continue to develop links with New Forest District Council and to supply information relevant to their requirements. In addition, the Agency proposes to encourage local industries to assist by monitoring the local impacts of their own operations where this is appropriate.

Issue No. S9. Inadequate understanding of the effect on public health of PM_{10} arisings from waste handling facilities

Background

8.2.35 The health effects of exposure to fine airborne particles have led the Government to set a stringent new standard for PM_{10} (particulate matter less than 10 micrometres). Waste handling operations are a potential source of PM_{10} emissions, however currently nothing is known about concentrations around such facilities in the UK.

Effects

8.2.36 There are a number of waste transfer stations in the LEAP area, and one landfill site, that may be contributing to local PM_{10} concentrations.

Options for Action

8.2.37

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Qualitative assessment of each facility, including emissions and opportunities for exposure.	Informed view on whether there may be significant public exposure close to such facilities.	Additional officer time.	Assessment will not show magnitude of risk.
Monitoring at local facilities	Firmer information on impact of each facility, and magnitude of risk.	Monitoring will be expensive £50-100k.	May not monitor at relevant locations or at relevant times.
Encourage and support national research programme	Firmer information on typical impacts of such facilities. Cost of monitoring spread.	Information not specific to local facilities.	May not relate well to local conditions.
Do nothing.	No cost.	Will not know if such facilities produce significant PM_{10} emissions.	Public may be exposed to elevated PM_{10} concentrations above health standard.

8.2.38 The Agency proposes to carry out a qualitative assessment of the impact of PM_{10} emissions from waste handling facilities in the LEAP area. This should consider the proximity of the public to these facilities, the degree of particulate matter emissions being created and opportunities for reductions in emissions. The Agency also recognises that monitoring should be carried out to address this gap in knowledge for an important pollutant, but as this is not just a local problem, such work should be co-ordinated at a regional or national level.

Issue No. S10, Lack of knowledge of fish stocks in still waters

Background

8.2.39 Our knowledge of the populations of fish in most of the still waters within the LEAP area is poor, as discussed in Section 3.

Options for Action

8.2.40

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Gather information as opportunity arises, e.g. by contact with owners and others with an interest in an inventory of local waters and their biota.	Gradual development of database at minimal cost.		Poor state of knowledge will only gradually be improved.
Mount immediate resource investigation.	Immediate access to information.	Considerable financial and manpower cost.	Benefit/cost ratio unsatisfactory.
Do nothing.		High level of ignorance of the stocks will continue.	Damage due to fish stocking. Failure to fulfil fisheries and conservation duties. Agency will be unable to take informed decisions regarding fishery management and conservation.

Issue No. S11. Low availability of free public fishing in the New Forest

Background

8.2.41 The Bartley Water holds fair populations of trout and coarse fish but is currently little fished by anglers.

Options for Action

8.2.42

OPTION	BENEFIT	DISBENEFIT / COST	RISK
Promote development of fishery.	Social value of urban angling fishery.	Minor manpower implications.	Objections from landowners and interested parties.
Do nothing.	No financial/manpower costs.		Opportunity for development of fishing will be missed.

Issue X. Manor Farm

8.3 Manor Farm, Pennington Site lies to the south west of Lymington and its western boundary is defined by the Avon Water. The southern boundary of the site abuts the Keyhaven Nature Reserve, an area of estuarine marshes which is a SSSI and a proposed SAC owned by Hampshire County Council. The Manor Farm site (also known as Efford) has been used for over 20 years for the extraction of surface gravels followed by progressive restoration of the resulting voids with household waste.

The Manor Farm site has the benefit of planning permission for mineral extraction and landfilling and a Waste Management Licence, issued under the Environmental Protection Act 1990, to control the landfilling operations. There is also consent to discharge surface water from the site issued under the Water Resources Act. The Environment Agency regulates the Waste Management Licence and the discharge consent. The site is currently operated by a private company within the required legal framework and there are no grounds that the local planning authority (Hampshire County Council) or the Agency could easily use to bring to an end the mineral workings and landfilling on the site. The existing reserves of minerals and landfill capacity have a high commercial value estimated as several million pounds.

The mineral workings have proceeded over the years in a southerly direction and now lie adjacent to the Keyhaven Reserve. Dewatering of the workings during the mineral extraction has a complex impact upon the ground and surface water regime in the nearby Reserve. This is considered to be one of the main factors threatening the ecology of the Reserve, particularly by reducing the salinity of the lagoons due to the pumped discharge of non-saline surface and groundwaters directly from the mineral site into the reserve. However, the effect of the drawdown of the groundwater by pumping from the site is not fully understood and hydrogeological studies are continuing.

An application for a modification of the discharge consent to divert the pumping of water to the Avon Water has been made and is currently being considered. Given the protected status of the area this is being looked at under the Habitats Directive. English Nature has recently requested further studies to be carried out to indicate the impact of discharging the site waters to the Avon Water.

Hampshire Wildlife Trust and a local pressure group which includes the Warden of the Nature Reserve are opposed in principle to the mineral workings and landfilling continuing. The latter group in particular have been very active in seeking to bring site activities to an end. The difficulty for the local planning authority and the Agency is that to rescind the current permissions, licences and consents at this time would require large compensation payments to be made to the operators with no guarantees that this would cure the problems being experienced on the Reserve. The formal designation of the Reserve as a SAC would require the permissions to be reviewed. The County Council, Agency and other interested parties are working together with the operators to seek to determine the environmental impact of the mineral extraction and landfilling activities before such a review is necessary.

APPENDICES

APPENDIX A

Glossary of Terms

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Glossary of Terms

[NB : Words in bold print are defined within this glossary]

Abstraction	Removal of water from surface or **groundwater**.
Abstraction Licence	Licence issued by the Environment Agency under S.38 of the Water Resources Act 1991 to permit removal of water from a source of supply. It can limit the quantity of water taken daily.
Acid Deposition	The deposition of acids or acid forming substances either as wet deposition, e.g. incorporated in rainfall, or as dry deposition, e.g. gas reacting with moisture on a surface.
ADAS	Agricultural Development and Advisory Service, formerly part of MAFF
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	A diverse group of simple aquatic plants, some microscopic, which can grow in rivers and the sea in great profusion (blooms).
Ammonia	A chemical found in water often as the result of discharge of sewage effluents. High levels of ammonia affect fisheries and **abstractions** for potable water supply.
Annex 1A Substance	Substance which has been selected for monitoring on the basis of its persistency, toxicity and ability to **bioaccumulate**.
AOD	Above Ordnance Datum.
AONB	Area of Outstanding Natural Beauty. Designated by the Countryside Commission under the National Parks and Access to the Countryside Act 1949, to conserve and enhance the natural beauty of the landscape, through the promotion of good management. At a national and regional level, planning laws protect AONB from major developments, but overall responsibility of care lies with the relevant authorities. Joint advisory committees are often formed.
Aquifer	Rock which holds substantial amounts of water in structure or fissures, e.g. chalk, sandstones, limestones.
Assarting	The enclosure of private farm land from common land.
Asset Management Plan 2	The second Asset Management Plan produced by the water companies for Office of Water Services (OFWAT). It sets out the water industry investment programme for the period 1995 - 2005.
Attenuation Feature	A pond designed to store surface water discharges from new development and attenuate (delay) its release. Such ponds can provide environmental enhancements if they are designed sympathetically.
BAP Species	Species listed in the Biodiversity Action Plans drawn up by the UK Biodiversity Steering Group (1995).

Civic Amenity Site (CA)	Facility provided by a local authority for householders to use to take bulky household waste, garden wastes and other household wastes which are not normally taken by vehicles on domestic waste collection rounds. Typically a modern CA site has containers for the segregated collection of recyclable materials and for vegetation for composting.
CMP	Catchment Management Plan.
Coarse Fish	This is a layman's terms for **cyprinid** fish and other commonly associated species such as pike, perch and eels of angling significance. Does not normally refer to minor species such as bullhead, stone loach, minnow and stickleback.
Coliforms	A group of bacteria distinguished by their ability to degrade lactose to produce acid and gas. They are used as indicators of possible contamination of water by sewage. The faecal coliforms, a subgroup of the coliforms, are normally found only in faeces and are therefore a more reliable indicator of contamination by sewage.
COMAH	Control of industrial Major Accident Hazards.
Confluence	The point at which two rivers meet.
Consent	A legal document raised by the Environment Agency which specifies the conditions under which a discharge may he made.
Conservation Regulations	Usual short title for the Conservation (Natural Habitats, etc) Regulations 1994 (SI No. 2716). These are the UK regulations which 'transpose' the EC Habitats and Species Directive into UK law.
Containment Bund	An earth bank intended to retain liquids.
Controlled Waste	Defined by the Control of Pollution Act 1974, Part I Section 30. It includes household, industrial and commercial waste.
Critical Load	The amount of a substance that can be deposited without having an adverse effect.
cSAC	Candidate Special Area of Conservation. Sites submitted to the EU by the Department of the Environment, for designation as a SAC.
CSO	Combined sewer overflow. A combined sewer is one which takes both surface and foul drainage - usually in older developments.
Cyprinind	Fish of the family Cyprinidae (e.g. roach, bream, carp, chub). In the strict sense pike, eel and some other fish species are not cyprinids.
Deemed Consent	Under legislation prior to the Water Resources Act 1991, if a consent application was not determined within the statutory timescale then it was 'deemed' granted, so becoming a deemed consent.
Derogate	Loss or impairment of water resource, action causing such loss or impairment.
DETR	Department of the Environment, Transport and the Regions (formerly DoE, DoT).
Development Plan	Statutory documents which set out local planning authorities' policies and proposals and can consist of Structure Plans, Local Plans and Mineral and Waste Local Plans.

BATNEEC	Principle for control of emissions from industrial plant using Best Available Techniques Not Entailing Excessive Cost.
Bed Loss	Loss of water through a permeable stream bed.
Bioaccumulation	Concentration of pollutants, such as metals, within the tissues of organisms.
Biodiversity	The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and ecosystems. (Article II of the Biodiversity Convention).
Birds Directive	Usual short title for the 1979 EU Council Directive on the Conservation of Wild Birds : The Birds Directive.
Blue-Green Algae	Ubiquitous, usually microscopic plankton with properties characteristic of both bacteria and algae. In still, calm conditions they can grow to excess to form dense blooms and scums, and are known to produce chemicals toxic to mammals.
BOD	Biochemical Oxygen Demand. A measure of the amount of dissolved oxygen consumed in water, usually as a result of organic pollution.
BOD (ATU)	Biochemical Oxygen Demand with nitrification suppressed by allylthiourea.
Boiling Mounds	Areas of burnt flint and charcoal representing prehistoric cooking areas.
BPEO	Principle for controlling total impact of industrial plant using the Best Practicable Environmental Option.
Brown Earth	A medium-textured brown soil with high organic content commonly found beneath deciduous forests in humid temperate zones.
Brown Field Site	Piece of land in rural context that has been subjected to some sort of development, e.g. airfield, landfill, etc.
Bryophytes	A group of lower, non-vascular plants including the mosses and liverworts.
Buffer Strip (Bio-Buffer)	Strip of land, 10 - 100m wide, alongside rivers which is removed from intensive agricultural use and managed to provide appropriate habitat types. Benefits include reduction of inputs into the river such as silt, nutrients, livestock waste, as well as improving habitat diversity and landscape.
Bund	A retaining wall designed to contain liquids in the event of failure of their container.
Calcareous	Of, or containing, carbonate or lime or sandstone.
Carcinogenic	Cancer causing.
Carr	East Anglian vernacular term used to describe alder woodland on fen peat. Often used in a New Forest context to describe low-lying alder woodlands subject to periodic flooding.
Catchment	The total area from which a single river collects surface run-off.
CEFAS	Centre for Environment, Fisheries and Aquaculture Science

DO	Dissolved Oxygen.
DoE	Department of the Environment, now part of DETR.
Dry Weather Flow (DWF)	When sewage flow is mainly domestic in character, the average daily flow to the treatment works during seven consecutive days without rain (excluding a period which includes public or local holidays) following seven days during which the rainfall did not exceed 0.25mm on any one day. With an industrial sewage the dry weather flow should be based on the flows during five working days if production is limited to that period. Preferably, the flows during two periods in the year, one in the summer and one in the winter, should be averaged to obtain the average dry weather flow.
Eel	Refers to the common eel *Anguilla*.
EIFAC	European Inland Fisheries Advisory Commission.
EN	English Nature.
Eocene	The geological period of time which elapsed between 54 and 38 million years before present.
Ephemeral	Lasting for only a short time, transitory.
Epiphytic Lichen	Tree dependent lichens.
EQS	Environmental Quality Standards. The concentration of a substance found in the environment which should not be exceeded in order to protect the environment or human health. An EQS is set by the EC through EC Directives and also by the Government.
ESA	Environmentally Sensitive Area (MAFF scheme). A scheme of tiered payments for adopting specific environmentally beneficial farming practices.
Eutrophication	**Nutrient** enrichment of water, e.g. increased nitrogen input leaching into rivers from soil treated with chemicals, this chemical enrichment resulting in increased productivity.
'Flashy'	Watercourse which has a rapid response to rainfall. Typically has long periods of low flows and high flows may be several hundred times low flow.
Geomorphological	The natural processes which produce river features such as channel form.
Gley	A compact and usually structureless soil with some horizons having a grey, blue or olive colour due to intermittent waterlogging.
Groundwater	Underground water that has come mainly from the seepage of surface water and is held in the soil and in pervious rocks.
Habitat and Species Directive	Usual short title for the European Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC). Amongst other issues this Directive amended the protection given to Special Protection Areas (SPAs) and created the new European designation Special Area of Conservation (SAC). Sometimes shortened further to the 'Habitats Directive'.
HMIP	Her Majesty's Inspectorate of Pollution.
IFE	Institute of Freshwater Ecology.

Improved Pasture	Regularly reseeded grassland on which fertilisers and herbicides are typically applied.
Integrated Waste Processing	Facility which involves a range of linked waste management activities, sorting of dry recyclable materials, anaerobic digestion, and incineration to produce heat and power.
IPC	Integrated Pollution Control - the system of pollution prevention and control, set out in the Environmental Pollution Act 1990, and administered by the Environment Agency.
IPPC	Integrated Pollution Prevention and Control.
Isohyet	A line on a map connecting places having the same amount of rainfall in a given period.
Landfill	A process whereby areas such as disused quarries are used to dispose of solid wastes in a controlled manner prior to being capped and revegetated.
Leachate	Solution formed when water percolates through a permeable medium such as waste. It can be mineral-rich, toxic or carry bacteria.
LEAP	Local Environment Agency Plan.
Lichen	A group of lower non-vascular plants representing a symbiotic association between a fungus and an alga, where the fungus is the dominant partner.
LNR	Local Nature Reserve. Nature reserves established, and usually managed, by district/borough councils. Local authorities are empowered to designate such sites under the National Parks and Access to the Countryside Act 1949.
Local Plan	A land use plan for a local area (normally a District) or specific topic (particularly minerals and waste). A Local Plan is prepared in accordance with Structure Plan policies. It sets out detailed policies to guide development including proposals for specific sites.
Macro-invertebrate	Large animal not possessing a backbone, e.g. snail, jellyfish.
Macrophyte	Plants clearly visible without the aid of a microscope but excluding lichens, fungi, mosses and algae.
MAFF	Ministry of Agriculture, Fisheries and Food.
Main River	Rivers designated as 'Main' on a map held by MAFF; generally defined as a watercourse of strategic nature, carrying flows from an upland catchment of significant size to the sea.
Mire	An area of undrained land which supports wet, spongy vegetation consisting mainly of mosses, sedges, rushes and some grasses. See also **valley mire**.
MRF	Minimum river flow.
Mutagenic	Causing genetic change which when transmitted to offspring causes heritable abnormal variation.
MOD	Ministry of Defence.

Natura 2000 Sites	A term created under the Habitats and Species Directive which encompasses both the SPA and SAC designations. Sometimes also referred to as 'European Sites' or occasionally shortened to 'N2K' sites.
NNR	National Nature Reserve. Sites owned or leased and managed by English Nature and established as reserves under the National Parks and Access to the Countryside Act 1949.
Non-Salmonid	See Salmonid - fish not belonging to the salmonid family, i.e. coarse fish and minor species.
NRA	National Rivers Authority.
NSA	Nitrate Sensitive Area. An area around a water supply source designated under Section 94 of the Water Resources Act 1991 where controls on nitrate inputs can be applied.
Nutrient	Chemical essential for plant growth, e.g. nitrate, phosphate.
NVZ	Nitrate Vulnerable Zone. An area designated under the EC Nitrates Directive to reduce pollution from agricultural sources and prevent further such pollution.
Oligocene	The geological period of time which elapsed between 38 and 26 million years.
Ordinary Watercourse	All watercourses which are not defined as **Main River**.
PAH	Polycyclic Aromatic Hydrocarbons are a group of hydrocarbons created during combustion, that are present as both gases and associated with airborne particles.
Part A Process	A process authorised by the Agency for integrated pollution control under Part 1 of the Environment Act 1990.
Part B Process	A process authorised by the Local Authority for air pollution control under Part 1 of the Environment Act 1990.
Pedology	The scientific study of the formation, characteristics, distribution and use of soils.
Percentile	One of 99 values of a variable dividing its distribution into 100 groups with equal frequencies.
pH	A measure of the concentration of hydrogen ions which cause acidity. Acid solutions have a pH of less than 7, alkalis of more than 7 and neutral solutions a pH of 7 (e.g. pure water).
PhabSim	Predictive Habitat Simulation.
Pleistocene	The geological period of time which elapsed between 2 million years and 100,000 years before present.
PM_{10}	Particulate matter less than 10 micrometres aerodynamic diameter.
Population Equivalent (pe)	The volume and strength of an industrial waste water expressed in terms of an equivalent population, based upon a figure of 0.060 kilogramme **BOD** per capita per day.
Possible cSAC	Sites currently being considered for submission to the European Commission as cSACs.

ppb	Airborne concentrations in parts per billion by volume.
PPG9	Planning Policy Guidance note on nature conservation produced by the UK Government. An essential note explaining how the various EC Directives and Regulations on conservation should be interpreted.
Prescribed Minimum Flow	Prescribed minimum flow is the low flow which is used to control **abstractions** to prevent adverse impact on other users, the environment or water quality.
Primary Treatment	The physical treatment of sewage effluent, usually by settlement, to remove gross solids, reduce suspended solids by about 50% and **BOD** by about 20%.
Q95	The flow of water in a river or stream that is equalled or exceeded for 95% of the time. It is a low flow but lower flows will be experienced from time to time in very dry periods.
RAMSAR Sites	International designation (on wetlands) named after the town in Iran where the text of the convention was agreed. The full title of theRamsar Convention is the 'Convention on Wetlands of International Importance, especially as Waterfowl Habitat'.
Regional Planning Guidance	Guidance issued by the Department of the Environment setting out Government policy to guide development in the region and provide a framework for Structure Plan reviews.
Reliable Yield	The output capacity of a reservoir, reservoir system, conjunctive use scheme etc. It is the average output (volume/day) that can be sustained through a design drought period. 1976 has been regarded as the critical historical drought sequence, with a risk of occurrence regionally of approximately 1:50 years but current research into extended flow sequences back to the last century and modelling particular water supply schemes suggests that 1975 - 76 may be much more severe than a 1:50 year sequence.
Riffle	Stony or gravelly part of stream or river bed shallow in dry flow (opposite of pool). Fast streams on most non-chalk areas have alternating riffles and pools.
Riparian Owner	Owner of land next to river; normally owns river bed and rights to mid-line of channel.
RQO	River Quality Objective. Use-related targets for chemical water quality used by the Agency to maintain or improve the quality of controlled waters.
RSPB	Royal Society for the Protection of Birds.
Run-Off	Rainwater which does not soak into the ground but which runs over the surface in a downhill direction.
SAC	Special Area of Conservation. An area designated under the EC Habitats Species Directive for the conservation of natural habitats, wild flora and fauna.
Salmonid	Fish belonging to the family Salmonidae (salmon, trout, grayling).
SAM	Scheduled Ancient Monument. Sites of national importance designated under the Ancient Monuments and Archaeological Areas Act 1979.
Secondary Treatment	Biological treatment and secondary settlement of sewage effluent, normally following **primary treatment**, capable of producing a substantial reduction in **BOD** and suspended solids.

Section 24 Maps	Land drainage survey showing catchment boundaries, areas at risk of flooding and location of flood defence structures.
Section 105 Survey	Section 105 of the Water Resources Act 1991 allows for Standards of Service Assets and Flood Risk Surveys.
Semi-Improved Pasture	Reseeded or undisturbed grassland which contains some species typical of unimproved pasture. Receives relatively little artificial fertilisers or herbicides.
SERPLAN	The London and South East Regional Planning Conference. A representative organisation of all local authorities in South East England which considers regionally important land use and transportation matters and provides advice to the Government accordingly.
SLA	Special Landscape Area. Areas of special landscape quality, designated by the County (i.e. not nationally endorsed), justifying the adoption, by the County, of particular development control policies and other safeguarding measures.
SINC	Sites of Importance for Nature Conservation. Sites selected by local authorities in conjunction with the Hampshire Wildlife Trust as sites of 'County' ecological importance.
Source	Point of **abstraction** of water, e.g. well, borehole, spring.
SPA	Special Protection Area. Sites identified by UK Government under the EC Directive on the Conservation of Wild Birds (79/409/EC).
SSSI	Site of Special Scientific Interest is the term used to denote an area of land notified under Section 28 of the Wildlife and Countryside Act 1981 (as amended) as being of special nature conservation or geological interest due to its flora, fauna and/or features of geological interest.
Strategic Road Network	Motorways, trunk roads and 'A' roads of more than local importance.
Structure Plan	A strategic land use and transportation policy development plan for a county area.
STW	Sewage Treatment Works.
Substrate	Material making up bed and underwater part of banks of stream. Gravels, silts, etc.
Surface Water	General term used to describe all the water features such as rivers, streams, springs, ponds and lakes.
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
SWQO	Statutory Water Quality Objectives (legally enforceable **RQOs**).
Transfer Station	Premises used for the temporary storage of waste not produced at that location, pending movement elsewhere. A transfer station is often used to store waste collected in a locality and from there it is 'bulked up' and taken to a final disposal/management point. Sorting and segregation of waste is also sometimes carried out at transfer stations where an element of the waste can be recycled or reused.
Tributary	A stream or river which feeds into a larger one.

Unimproved Pasture	Permanent grassland which has not been disturbed for many decades and typically receives no artificial fertilisers or herbicides. Rich in grasses, sedges and flowers.
Unsaturated Zone	That part of an **aquifer**, above the water table, in which cracks, fissures and other large voids are normally air-filled.
Valley Mire	Habitat which occurs along the lower slopes and floors of small valleys, usually around a central watercourse which is fed from springs and seepages on the valley sides. Valley mire is typically dominated by wetland plants, often moss-rich and usually occurs over a thick layer of peat (> 0.5m).
VOCs	Volatile organic compounds.
WWTW	Waste Water Treatment Works
Water Table	The surface which forms the upper zone of groundwater saturation is in an aquifer. Above this level the rocks or soils are unsaturated.
Weil's Disease	Also known as Leptospirosis - disease associated with rats' urine. River users may be at risk.

Units

%ile	Percentile
%sat	% saturation (of oxygen)
km	Kilometre
km²	Square kilometres
m	Metre
mm	Millimetre
mg/l	Milligrams per litre (one milligram = 0.001 grams)
m³/d	Cubic metres per day
Ml/a	Megalitres per year (one million litres per year)
Ml/d	Megalitres per day (one million litres per day)
ng/l	Nanograms per litre (one nanogram = 0.000,000,001 grams)
ppm	Parts per million
ppb	Parts per billion
µg/l	Micrograms per litre (one microgram = 0.000,001 grams)
<	Less than
>	Greater than

APPENDIX B

List of Environment Agency Publications

APPENDIX B

List of Environment Agency Publications

- A Guide to Identifying Freshwater Crayfish in Britain and Ireland. 1995.
- A Guide to Information Available to the Public. April 1996.
- A Strategy for Implementing the Agency's Contribution to the UK Biodiversity Action Plan. 1996.
- An Environmental Strategy for the Millennium and Beyond. September 1997.
- Anglers and the Agency. March 1997.
- Annual Conservation Access and Recreation Report 1995/96. November 1996.
- Annual Report 97-98.
- Corporate Plan 1995-96 (NRA). July 1995.
- Corporate Plan Summary 96-97. October 1996.
- Corporate Plan Summary 97-98.
- Customer Charter Booklet. April 1996.
- Cut Waste Save Money. November 1996.
- Defenders of the Sea. May 1997.
- Environment Agency - National Guide. February 1996.
- Environment Agency - Southern Region Insert. March 1996.
- Farm Waste Management. February 1997.
- Farm Waste Management Plans. February 1997.
- Fisheries Factsheets. March 1997.
- Fishing in the South. August 1996.
- Flood Warning General Information. September 1996.
- Flood Warning Information in Hampshire. 1997/1998.
- Guardians of the Environment. October 1996.

- Guidance for the Control of Invasive Plants Near Watercourses. 1996.
- Guidance on Development in Areas of Risk of Flooding, 1996. Arup for Environment Agency.
- Guidance on Development in Areas at Risk of Flooding. Technical Summary, January 1997.
- Hampshire & Isle of Wight Directory. June 1996.
- Hampshire & Isle of Wight Recycling Directory.
- Mink. 1995.
- Otters and River Habitat Management Technical Handbook. 1995.
- Phytophthora Disease of Alder. 1997.
- Policy and Practice for the Protection of Floodplains. January 1997.
- Pollution Prevention Guidelines. January 1997.
- River Catchment Data Report. June 1996.
- River Pollution and How to Avoid it. December 1996.
- River Test. March 1992.
- River Test CMP Phase 1 and Final Report (NRA).
- Riverside Owners Guide. 1997.
- Saving Water - Taking Action. October 1997.
- State of the Water Report Six Year Trends Report (NRA). January 1996.
- Sustaining our Resources - Update. July 1997.
- The Environment of England and Wales - A Snapshot. April 1996.
- Understanding Buffer Strips. 1996.

- Hythe Waterfront Supplementary Planning Guidance, New Forest District Council, December 1995.
- Minister; Mandate to Forestry Commission, 22.12.92. MAFF.
- Municipal Year Book 1997. Newman Books.
- New Forest Management Plan 1992 - 2001. Forestry Commission.
- NF District Council - Environment Protection Group - Air Pollution Monitoring Strategy. March 1995.
- NF Sport and Recreation Study - University of Portsmouth Enterprise Ltd. July 1996.
- New Forest District Coastal Management Plan, New Forest District Council, 1997.
- New Forest District Local Plan Deposit, New Forest District Council, November 1995.
- 'New Forest Rivers - Policies and Issues' - Nov 1996. Hampshire & Isle of Wight Wildlife Trust Ltd.
- RPG9 Regional Planning Guidance for the South East, DoE, March 1994.
- Strategic Guidance for the Solent. Solent Forum.
- 'Southern England Radiation Monitoring Programme, Annual Report 1995-1996' - Geosciences Advisory Unit, Southampton Oceanography Centre.
- 'Sustaining Our Resources' - Update 1997 (Environment Agency Water Abstraction and Use Policy)
- Transport Policies and Programme 1997 - 1998, Hampshire County Council, July 1996 (not that this is published each year in July).
- W Solent and Southampton Water Coastal Group - Shoreline Management Plan. Steering Group Draft, Vol. 2. Halcrow, 1997.
- United Kingdom National Air Quality Strategy. DoE, March 1997.

APPENDIX C

List of Publications Affecting the LEAP Area

APPENDIX C

List of Publications Affecting the LEAP Area

- 'A Strategy for the New Forest - Full Working Document', New Forest Committee 6/2/97
- Annual Report, 1996 - 1997, New Forest Committee
- Anon, 1995a. Biodiversity : The UK Steering Group Report. Volume I : Meeting the Rio Challenge. HMSO : London.
- Anon, 1995b. Biodiversity : The UK Steering Group Report. Volume II : Action Plans. HMSO: London.
- Borough of Christchurch Local Plan, Deposit Plan, Christchurch Borough Council, January 1997.
- Bournemouth and West Hants Water - Environmental Review, Annual Report on Conservation, Recreation and Access 1995/1996.
- Coastal Planning. PPG20, September, 1992. HMSO.
- Coastal Towns Local Plan, New Forest District Council, 1990.
- Consultation paper - 'Cycling on the Crown Lands of the New Forest', Forestry Commission, 1997.
- Consultation paper - 'A Framework for Recreation', Forestry Commission, 1996.
- Deposit Hampshire County Structure Plan 1996 - 2011 (Review), Hampshire County Council, March 1996.
- Development & Flood Risk. Joint Circular DoE, MAFF, Welsh Office. 16.12.92.
- Draft Environment & Natural Resources Policies. SERPLAN .
- Forest and Downlands Villages Local Plan, New Forest District Council, 1986.
- Hants CC Report - Consultation Draft 'A Transportation Strategy for the NF'.
- Hampshire County Structure Plan, Hampshire County Council, March 1994.
- Hampshire Minerals Local Plan, Hampshire County Council, November 1987.
- Hampshire Minerals and Waste Local Plan, Deposit Plan incorporating proposed modifications (March 1997), Hampshire County Council, May 1997.
- Highcliffe and District Local Plan, Christchurch Borough Council, October 1989.

APPENDIX D

Organisations with Responsibilities Within the LEAP Area

APPENDIX D

Organisations with Responsibilities Within the LEAP Area

English Nature
1 Southampton Road
Lyndhurst
Hampshire
SO43 7BU

Statutory adviser to Government on nature conservation in England, promoting conservation of England's wildlife and natural features. Its work includesthe selection, establishment and management of National Nature Reserves and Marine Nature Reserves, the identification and notification of Sites of Special Scientific Interest, the provision of advice and information about nature conservation and the support and conduct of research relevant to these functions.

Forestry Commission
Queen's House
Lyndhurst
Hampshire
SO43 7NH

Statutory organisation which has a general duty to promote the interests of forestry, the development of afforestation, the production and supply of timber and the establishment and maintenance of reserves of growing trees in Great Britain. Comprises Forest Enterprise (management) and Forestry Authority (monitoring/auditing).

The Commission's management of Crown Land is controlled by the New Forest Acts 1877, 1949, 1964 and 1970. Policy and operations are determined by the Mandate of the Minister for Agriculture which includes a Management Plan for the Forest.

Hampshire County Council
The Castle
Winchester
Hampshire
SO23 8UJ

Local Authority with statutory responsibilities for:-

- Strategic Planning
- Minerals and Waste Planning
- Strategic Emergency Planning
- Countryside Management
- Transport
- Rights of Way
- Outdoor Activities Centres
- Coast Protection and Sea Defence
- Specialist Advice - ecology, landscape, historic buildings, archaeology

New Forest Committee
4 High Street
Lyndhurst
Hampshire
SO43 7BD

Independent non-statutory body which maintains, enhances and promotes conservation, social and economic interests of the New Forest. The Committee co-ordinates the work of the following member organisations:-

- Forestry Commission
- English Nature
- New Forest District Council
- Salisbury District Council
- Test Valley Borough Council

- Country Landowners Association / National Farmers Union
- Verderers of the New Forest
- Hampshire County Council
- Wiltshire County Council
- Countryside Commission

New Forest District Council
Appletree Court
Lyndhurst
Hampshire
SO43 7PA

Local Authority with statutory responsibilities for:-

- Land Use Planning
- Environmental Health
- Recreation
- Tourism
- Coast Protection
- Emergency Planning

Verderers of the New Forest
The Queen's House
Lyndhurst
Hampshire
SO43 7NH

Organisation with statutory and judicial responsibilities for:-

- Management of commoning and animal health
- Conservation of the open Forest and the regulation of grazing

APPENDIX E

General Quality Assessment Chemical and Biological Grades

APPENDIX E

General Quality Assessment Chemical and Biological Grades

Biological Assessment

The biological scheme is based on groups of macroinvertebrates (small animals including mayfly, nymphs, snails, shrimps and worms) that are found on the river bed. Macroinvertebrates are used because they:-

- do not move far;
- have reasonably long life cycles;
- respond to the physical and chemical characteristics of the river;
- are affected by pollutants which occur infrequently and which are not measured by spot-sampling used in the GQA (Chemical) scheme;
- provide a picture of quality integrated over time.

By comparing taxa found in the sample with those expected if the river were unpolluted, rivers can be classified into one of six grades (Table 1).

Table 1 - GQA Scheme for Biology

GRADE	OUTLINE DESCRIPTION
a - Very Good	**Biology similar to (or better than) that expected for an average and unpolluted river of this size, type and location. High diversity of taxa, usually with several species in each. Rare to find dominance of any one taxon.**
b - Good	**Biology falls a little short of that expected for an unpolluted river. Small reduction in the number of taxa that are sensitive to pollution. Moderate increase in the number of individuals in the taxa that tolerate pollution.**
c - Fairly Good	**Biology worse than expected for an unpolluted river. Many sensitive taxa absent, or number of individuals reduced. Marked rise in numbers of individuals in taxa that tolerate pollution.**
d - Fair	**Sensitive taxa scarce and contain only small numbers of individuals. A range of pollution tolerant taxa present, some with high numbers of individuals.**
e - Poor	**Biology restricted to pollution tolerant species with some taxa dominant in terms of the numbers of individuals. Sensitive taxa rare or absent.**
f - Bad	**Biology limited to a small number of very tolerant taxa such as worms, midge larvae, leeches and water hoglouse, present in very high numbers. In the worst case, there may be no life present.**

Chemical Assessment

The basic chemical grade of the GQA Scheme is defined by standards for the concentrations of BOD, ammonia and dissolved oxygen. These have been selected because they are indicators of the extent to which waters are affected by waste water discharges and rural landuse run-off containing organic, degradable material. The quality of many of our rivers and canals is affected by such discharges which include effluents from sewage treatment works and industries, and drainage from farms. These three simple determinands are therefore the best overall basic chemical measure of river water quality for the purposes of the GQA which will apply to all rivers and canals within the classified network.

Table 2 - GQA Chemical Grading for Rivers and Canals

Water Quality	Grade	Dissolved Oxygen	Biochemical Oxygen Demand (ATU)	Ammonia
		(% Saturation) 10-percentile	(mg/l) 90-percentile	(mgN/l) 90-percentile
Good	A	80.00	2.50	0.25
	B	70.00	4.00	0.60
Fair	C	60.00	6.00	1.30
	D	50.00	8.00	2.50
Poor	E	20.00	15.00	9.00
Bad	F	Quality does not meet the requirements of Grade E in respect of one or more determinands.		

A summary of the grade limiting criteria is given in Table 2 above. The overall grade assigned to a river or canal reach is determined by the worst of the three grades for the individual determinands.

The grades are defined in terms of the 90-percentile for BOD and ammonia and the 10-percentile for dissolved oxygen; in other words, the river reach should contain less than the specified levels of BOD and ammonia for at least 90 percent of the time; whilst the level of dissolved oxygen must not fall below the prescribed level for more than 10 percent of the time.