



**local** environment agency plan

**AXE & LIM**

**ACTION PLAN**

**PLAN from DECEMBER 2000 to DECEMBER 2005**



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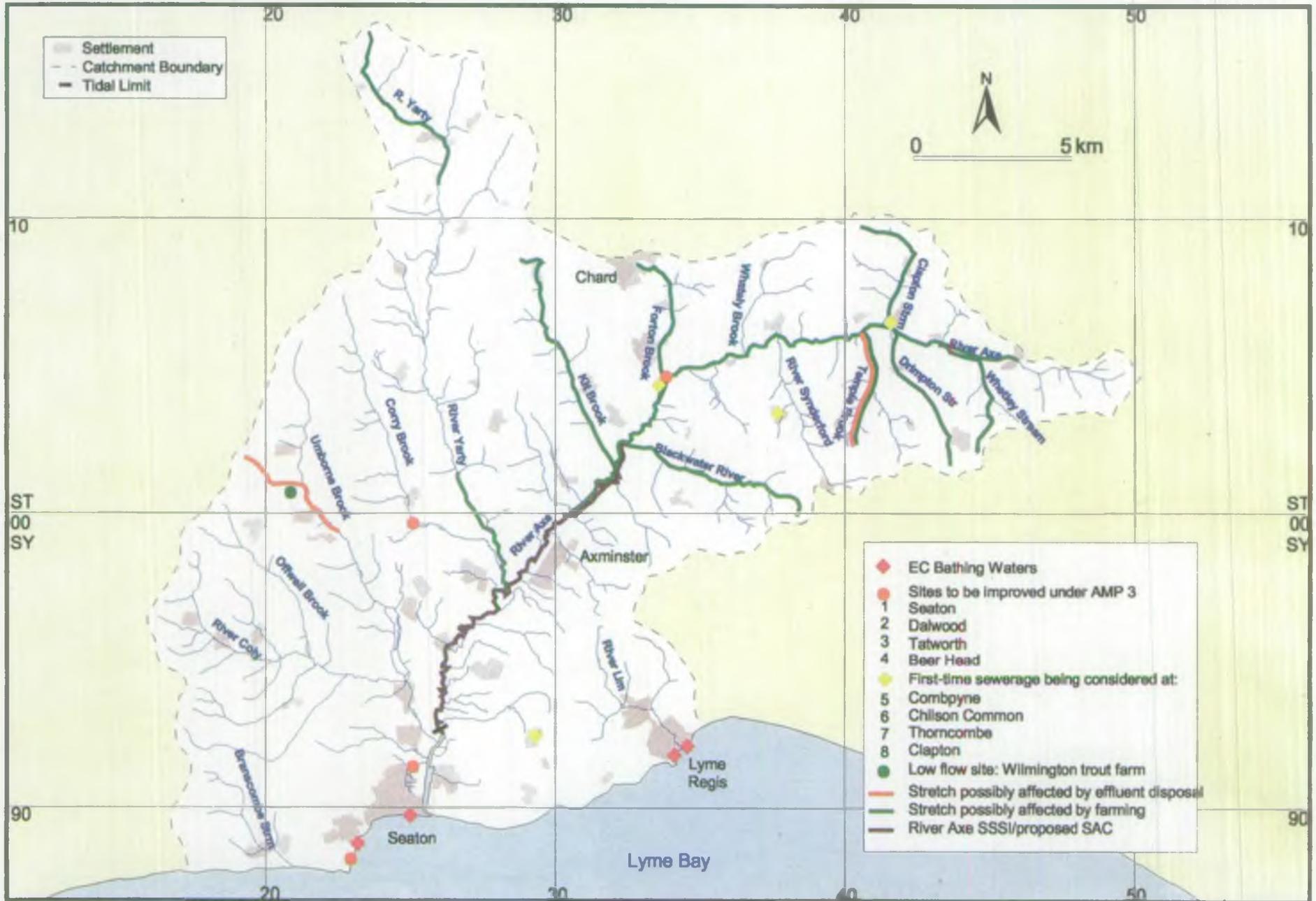


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Map 3 - Effluent Disposal/Farming/Eutrophication



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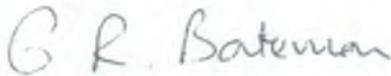
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## Foreword

The Environment Agency is a major environmental organisation responsible for regulating waste disposal to land, industrial releases to air, and safeguarding and improving the water environment. Our aim of integrated environmental improvement in the Axe and Lim LEAP area contributes to the achievement of global sustainability in accordance with the spirit of the 1992 Rio de Janeiro 'Earth Summit' agreement.

The LEAP area encompasses parts of the East Devon, the Blackdown Hills and the West Dorset Areas of Outstanding Natural Beauty which offer protection to a diverse landscape. The coastal area forms part of the proposed World Heritage Coast and includes the towns of Lyme Regis and Seaton. A stretch of the River Axe has been put forward as a proposed Special Area of Conservation (pSAC) and is currently designated a Site of Special Scientific Interest (SSSI) and there are numerous sites of historical interest. We must all work to protect the beauty and diversity of the area from growing pressures whilst recognising their importance to the local economy.

This Action Plan sets out what we believe to be the environmental issues in the LEAP area, together with actions to be carried out both by ourselves and in partnership with others.



**GEOFF BATEMAN**  
Area Manager (Devon)

Further copies of this Local Environment Agency Plan (LEAP) can be obtained from:

LEAPs (Devon Area)  
The Environment Agency  
Exminster House  
Miller Way  
Exminster  
Devon EX6 8AS  
Telephone: (01392) 444000

**[caroline.trevaskis@environment-agency.gov.uk](mailto:caroline.trevaskis@environment-agency.gov.uk)**

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# 1. Introduction

## 1.1 The Environment Agency

We have a wide range of duties and powers relating to different aspects of environmental management. These duties are described in more detail in Section 6. We are required and guided by Government to use these duties and powers in order to help achieve the objective of sustainable development. The Brundtland Commission defined sustainable development 'as development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.

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

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

One of the key outcomes of the United Nations 'Earth Summit' held in Rio de Janeiro in 1992<sup>2</sup> was agreement by governments that, in order to solve global environmental problems, local action is crucial: we must all therefore think globally but act locally.

### **Our vision is:**

- a better environment in England and Wales for present and future generations

### **Our aims are:**

- to achieve necessary improvements in the quality of air, land and water
- to encourage the conservation of natural resources, animals and plants
- to make the most of pollution control and river-basin management
- to provide effective defence and warning systems to protect people and property against flooding from rivers and the sea
- to reduce the amount of waste by encouraging people to re-use and recycle their waste
- to improve standards of waste disposal
- to manage water resources to achieve the proper balance between the country's needs and the environment
- to work with other organisations to reclaim contaminated land
- to improve and develop salmon and freshwater fisheries
- to tell people about environmental issues by educating and informing
- to set priorities and work out solutions that society can afford

### **We will do this by:**

- being open and consulting others about our work
- basing our decisions around sound science and research

- valuing and developing our employees
- being efficient and business like in all we do

## 1.2 Local Environment Agency Plans (LEAPs)

In January 1997 we published the Rivers Axe and Lim Catchment Management Plan Action Plan, following a consultation process instigated by one of our predecessor organisations, the National Rivers Authority (NRA). We now hope to build on this by widening the scope of environmental issues tackled to cover all of our areas of responsibility by producing this Local Environment Agency Plan (LEAP).

We are committed to a programme of LEAPs to help us identify, assess, prioritise and solve local environmental issues related to our functions, taking into account the views of our local customers.

The LEAP process involves several stages as outlined below:

**The LEAP Consultation Draft** - The publication of the Axe and Lim LEAP Consultation Draft marked the start of a three-month period of formal consultation. The purpose of the consultation was to enable external organisations and the general public to put forward their views on the environmental issues which affect the area. At the end of the consultation period we produced a Statement of Public Consultation which gave the results of the process and our response to the comments made, copies are available on request. A list of the organisations and other bodies who responded to the Consultation can be found in the Appendix.

**The Action Plan** - The Action Plan takes into account the results of the consultation and sets out actions, identifying costs, timescales and partner organisations. Agreed actions will be incorporated into our annual business plan.

**Updating and reviewing this plan** – Around the anniversary of publication of the Action Plan and then every 12 months thereafter we will publish an **Annual Review** to report on the progress in carrying out our planned actions, to both the LEAP Steering Group, Key Stakeholders and the wider community. This will also provide us with an opportunity to add new issues and actions and to remove or amend those which are no longer appropriate. **We invite people to contact us at any time to raise new issues or suggest new actions - this ensures the LEAP process is an active one, which constantly evolves to meet the changing needs of the local environment. Our address can be found at the front of this Plan.** After five years, or sooner if required, we will carry out a major review of the progress we have made. At this stage we will produce a new LEAP Consultation Draft to reflect these changes to further improve the local environment.

## 1.3 Action Tables

The tables in Section 4 outline the actions needed to address the issues identified as part of the LEAP process. These tables show the following information:

- the organisations which will be involved in implementing the proposed actions, either in a lead role or as a key supporter, are listed under the heading '**Action by Lead/Other**'
- which of the Agency's nine environmental themes (see Section 4) the action addresses
- a timetable for progressing the action
- an estimate of the cost to us over the next five years. The inclusion of a cost does not mean funds have been allocated to the action. The letters 'n/a' indicate that we do not contribute to the funding of the action. There are also actions where the cost of completion is not yet known. All actions will be incorporated into our annual Devon Area Business Plan on a priority basis and bids will be made for appropriate funding. It should be noted that the inclusion of an action in the LEAP does not guarantee that funding will be available for its completion.
- the financial years covered by this plan are represented by a single year. For example, '00' identifies the financial year April 2000 to March 2001

Please refer to the Appendix at the end of the report for the definition of acronyms and abbreviations.

The following points should also be noted:

- our everyday work commits substantial resources to monitoring and managing the environment

- some actions will require feasibility studies and cost-benefit appraisal of options prior to work commencing. In some cases, depending on the outcome of these studies, further actions may not be justified. Both ourselves and participating organisations have limited resources and powers and this means that some work may take longer than indicated owing to funding availability, government policy or changing priorities
- new actions will be added to the LEAP as part of the ongoing process and will be highlighted in the Annual Reviews

## 1.4 Devon Area Business Plan

The LEAP process defines our local priorities, together with our national and regional priorities, these form the Devon Area Business Plan which sets out the activities that will be carried out in this area each year.

The Devon Area Business Plan provides a focus to our work and allows managers to ensure the delivery of the required work and to identify and allocate resources. The plan enables us to manage change, as tasks can be re-prioritised and resources reallocated as needs arise.

## 2. The LEAP Area

The area covered by this plan is shown on Map 1. The Axe and Lim LEAP area straddles the counties of Devon, Dorset and Somerset and comprises the catchments of the River Axe and the River Lim, which drain to the sea at the coastal resorts of Seaton and Lyme Regis respectively. Key statistics for the area are given below.

### Key statistics for the Axe and Lim LEAP area

LEAP Area	443 km <sup>2</sup>
Average Annual Rainfall	945 mm
Length of river monitored for classification purposes	164.7 km
Population (1991 census)	40,000 (approx)
Main Urban Areas	Axminster, Seaton, Lyme Regis
Administrative Areas (see Map1)	East Devon District Council, South Somerset District Council, West Dorset District Council, Taunton Deane Borough Council

### 2.1 Physical features

The main stem of the River Axe flows through an almost unbroken agricultural landscape from its source to the sea, a fact reflected in the ecology of the river. The Axe Valley is fairly broad, even at its uppermost limits, where it is positioned between the rivers running north off the Yeovil Scarplands to the Somerset Levels and those flowing south to Lyme Bay across Marshwood Vale. The valley then opens up into a broad, flat-bottomed floodplain through which the river meanders widely, leaving behind old channel features, such as oxbow lakes, as it shifts over time.

The River Yarty, Corry Brook and Umborne Brook originate on the steep slopes of the Blackdown Hills, where springs rising on the valley sides create wetlands and rough pasture. The upper valleys are well wooded; lower down, small fields, enclosed by hedges, are typical. The valleys finally open out as the tributaries meet the main river floodplain. The River Yarty joins the River Axe to form an extensive area of floodplain, which has been changed by the major communication routes of the new A35 and the older railway. The presence of these man-made features has resulted in necessary but conspicuous erosion-control measures.

The River Lim, Branscombe Stream and a number of small tributaries of the River Axe flow through short, steep-sided valleys cut into the open landscape of the Greensand and clay plateau backing the coast. The enclosed nature of the valleys contrasts with the larger arable fields and pastures of the plateau.

The River Coly, which rises 1.5 km south-east of Honiton, discharges to the Axe Estuary.

The Axe Estuary was once much wider than it is now, with extensive intertidal areas on the western edge. It is still an ecologically important area with the mudflats and remnant saltmarsh interlaced with tidal creeks. However, the extensive sweep of the Seaton marshes to the west, once also upper saltmarsh, is now separated from the channel by an embankment and the tramway, and has largely been subject to agricultural improvement to pasture.

The coastal section of the LEAP area contains some of the region's most important and spectacular sites. Steep cliffs in the west are interrupted by small valleys, before rising again to sheer chalk cliffs at Beer Head. Further east, stretching from Axmouth to Lyme Regis, is the Undercliff area of woodland, the largest example of its type in England. The cliff face has, in a series of massive events, slumped to produce a largely untouched wilderness of wooded cliffs and chasms.

### 2.2 Geology and soils

The solid geology of the Axe and Lim LEAP area is represented by rocks of the Triassic, Jurassic and Cretaceous Periods. In addition, large areas are overlain by recent and Pleistocene drift deposits.

Underlying the western part of the River Axe catchment between Seaton and Axminster are Triassic Mercia Mudstone Group deposits consisting mainly of calcareous clays and mudstones. On the higher ground to the east, the Cretaceous Upper Greensand is found at outcrop, with deposits typically 30 to 50 metres thick. Overlying the geologically older Upper Greensand, the Cretaceous Chalk forms isolated hill tops. Drift deposits of Clay with Flints commonly cover the Upper Greensand and Chalk hardrocks, forming the East Devon Table Lands. Most of the major river valleys have associated

recent deposits of river gravels and alluvium. Landslips have occurred in a number of places within the area, particularly where the Cretaceous Gault Clay outcrops along valley sides.

Slopes in the LEAP area are mainly covered by brown earth soils. Land surrounding the main river channel and some tributaries is typically fine, loamy soil with a low permeability and subject to seasonal waterlogging. Pockets of low permeability clay soils may also be found overlying the mudstones. In the river valleys, stoneless clay soils are found which are subject to flooding. The River Lim catchment has similar soils to that of the River Axe catchment, with brown earths covering much of the area while the coastal area surrounding Lyme Regis is covered by low permeability clay soils supporting mainly grassland with some crops and woodland.

**Hydrogeology** – The Cretaceous Upper Greensand and Chalk deposits of the Axe and Lim LEAP area have both been classified by us as major aquifers. In Wilmington, and also at Pinhay on the coast, the Upper Greensand and overlying Chalk drains to major springs which are utilised for public water supply. Other public water supplies sourced by the Upper Greensand are found on land overlooking Seaton Bay (Couchill Springs and the Bovey Lane boreholes). In addition, numerous minor springs have been tapped and boreholes drilled into these Cretaceous rocks for domestic and agricultural purposes with the springs also supporting valuable wetland habitats: the springline mires.

The Chalk, like the Greensand, has been exploited locally for private water supplies.

The Jurassic Bridport and Yeovil Sands and the Inferior Oolite have been classified by us as minor aquifers, providing locally important water supplies. Springs from these strata also contribute to the headwaters of the River Axe. Although classified as non-aquifers (on account of their very low permeability and yield), the Lower Liassic mudstones together with the Mercia Mudstones, and the Clay with Flints, may yield small quantities of water sufficient to support a limited number of private water supplies.

In general, groundwater makes a significant contribution to the baseflow of the River Axe, serving to maintain river flows during dry weather.

**Rainfall** - There is considerable contrast in rainfall between the wet high grounds of the Blackdown Hills and the North Dorset Downs, and the more sheltered lowland areas of the Axe Estuary. Average rainfall varies with altitude from 820 mm along the coast to over 1067 mm on high ground.

**River flow** - River flow is continuously measured at three gauging stations in the area. There are also ten instantaneous water level stations which are used for flood warning purposes. A summary of flow statistics for the area is shown below.

Table A - Summary of flow statistics for Axe and Lim LEAP area

	Flow m <sup>3</sup> /s
River Axe mean daily flow	5.11
River Axe maximum daily mean flow (27 December 1979)	144.72
River Axe maximum instantaneous flow (27 December 1979)	244.00
River Axe minimum daily mean flow (7 August 1976)	0.45
River Lim theoretical mean daily flow (no gauging station on this river)	0.27

**Groundwater** - There are groundwater monitoring stations at Beer (monitoring water levels in the Upper Greensand/Clay with Flints), Rousden (Upper Greensand), Furlins (Upper Lias) and Whitlands (Upper Greensand) which continuously monitor groundwater levels in the area.

## 2.3 Habitats and Species

The LEAP area drains towards Lyme Bay, which supports a diverse assemblage of marine communities of national importance<sup>3</sup> and contains coastal features of international scientific and educational importance. There are a number of wildlife and landscape designations which apply to this area, including: the proposed World Heritage Site for the Dorset and East Devon Coast, the Axmouth to Lyme Regis Undercliffs National Nature Reserve and the Sidmouth to West Bay candidate SAC.

Within the area, two sites are being considered as candidate Special Areas of Conservation under the EC Habitats Directive<sup>9</sup> as they contain habitats or species which are rare or threatened in a European context: Beer Quarry and Caves is an important site for bats; while Sidmouth to West Bay (which includes Sidmouth to Beer Coast SSSI, Axmouth to Lyme Regis SSSI and a small section of West Dorset Coast SSSI) contains some of the UK's best vegetated seacliffs (see Map 5). In addition, the River Axe has recently been put forward as a proposed SAC on account of its importance as a river with distinctive communities of floating vegetation and three fish species of European importance, namely Bullhead, Brook Lamprey and Sea Lamprey.

Twenty-one areas are designated Sites of Special Scientific Interest, indicating their national importance. Eight sites are notified at least partly for wetland interest. A 13 kilometre stretch of the River Axe, between the tidal limit and the confluence with the Blackwater River, has been designated as a SSSI for both its diverse and abundant flora and its fluvial geomorphologic interest. Nine SSSIs are designated at least partly because of their geological importance. One Regionally Important Geological Site (RIGS) has been identified within the LEAP area, by the Devon RIGS group. There is a need to support the documentation of important geological sites within the LEAP area to determine the full extent of this resource and we will continue to support this initiative.

A large section of the LEAP area, particularly that including the River Yarty and Corry Brook, falls within the Blackdown Hills Environmentally Sensitive Area. This designation aims to encourage traditional farming methods, resulting in protection of the ecology, landscape and historic features of the area. The scheme, funded by MAFF, offers financial incentives to landowners to support practices that may otherwise not be economically viable.

There are a number of Local Nature Reserves (LNRs), including the recently designated Seaton Marshes (Grazing Marsh). Some LNRs are wetland sites which are open to the public.

Key wetland habitats within the LEAP area are: Rhôs pasture (including spring-line mires and fen), alder and willow carr, coastal flushes and estuarine habitat. Most of the best examples of these habitats are already protected by designation, but attention needs to be focused on those unprotected areas.

The species of particular note and of relevance to our activities within the LEAP area include otter, pipistrelle bat, sand martin, kingfisher, curlew, reed bunting, barn owl, lapwing, snipe, Atlantic salmon, lamprey (species unconfirmed), marsh fritillary butterfly, medicinal leech, invertebrates of exposed riverine sediments and short-leaved water-starwort. A more detailed account of the importance of these species within the LEAP area can be found in Issue 7 – Enhancing Biodiversity.

## 2.4 Archaeology and Heritage

The LEAP area includes many sites and features of historic and archaeological value; some are designated, while others remain unprotected. The County Sites and Monuments Registers held by County Councils are the main sources for assessing archaeological interest as they contain a huge amount of information; some 50,000 items are recorded for Devon.

Those sites recognised as being of national importance may be scheduled as Ancient Monuments. About 40 such sites have been designated in the LEAP area; in addition three historic parks and gardens are present.

Buildings of particular importance are protected by the Planning (Listed Buildings and Conservation Areas) Act 1990; several grades of listed building are recognised. Where whole sections of towns or villages are felt worthy of protection, Conservation Areas are designated to preserve and enhance their character. Some 15 settlements in the area contain Conservation Areas.

Archaeological evidence, notably 2500 stone axes from Broom (on the River Axe), dates back as far as 250,000 years ago and finds in these numbers make the area fairly unique. There is also significant evidence for Mesolithic (c.8,000-4,000 BC) hunter-gatherer activity from the area, particularly from around Stockland and Membury. Later colonisation during the Neolithic and Bronze Age periods resulted in more prominent features such as round barrows. It was also at this time that much of the initial clearance of native forest took place. During the Iron Age hill forts such as those at Musbury, Membury, Lamberts Castle and Pilsdon Pen must have dominated the surrounding area which may have been the tribal boundary between the Durotriges and Dumnonii, and important evidence for rural Iron Age settlement has been found beneath later Roman sites at Seaton and Uplyme.

The area was further developed during the Roman period. The main Roman road from Dorchester to Exeter intersected the Fosse Way at Axminster. Here the Exeter road also crossed the Axe and Yarty floodplain and important excavations have taken place on the road here. This nodal point (Woodbury) was the site of a Roman fort and later civil settlement, and there may have been a Roman military or naval base, at Seaton. The remains of a substantial villa is also known to have existed at Holcombe near Uplyme.

By the time Domesday was produced in 1086, much of the current pattern of development was already established. For example the practice of enclosure had created the small fields typical of much of East Devon. In 1209 Axminster was made a free borough and in 1247 an Abbey had been established close to the town. Information on the following period is rather sparse, but it appears that improvements in technology began to allow cultivation of the heavier soils in lowlands and valleys and, as a result, settlements increased.

Axmouth began to decline as a commercial port after a severe storm in 1377. Following this storm a shingle bar appeared

across the mouth of the estuary, restricting access to the port. Other changes to the character of the area arose from developments in land management, with the creation of a number of estates and other large landholdings, and from new infrastructure such as the building of roads and railways. In places these had a direct impact on the water environment; at Forde Abbey, for example, manipulation of streams to feed ornamental and fish ponds had taken place, while the Cannington viaduct over a tributary of the River Lim was built around 1900 for a now dismantled railway link from Axminster to Lyme Regis.

The setting of several towns and villages is affected by their relationship to streams and rivers; Lyme Regis is particularly strongly influenced, built astride the small but steep river, with buildings straddling the channel at a number of points. In addition, leats guide water from the river to old mills in the centre of the town.

## 2.5 Landscape

The landscape of the LEAP area is significant in being covered by one landscape designation or another. The Blackdown Hills Area of Outstanding Natural Beauty (AONB), East Devon AONB and West Dorset AONB cover the north, south and eastern sections of the LEAP area respectively. Most of the isolated areas which remain are considered to be of county importance being designated an Area of Great Landscape Value (in Devon) and Special Landscape Area (in Somerset). The designation is recognised by local authorities within structure and local plans and sites are therefore protected through the development control process. The coastline is also recognised for its natural beauty being defined as a Heritage Coast. Again protection is afforded through structure and local plans.

In addition to statutory landscape designations, English Nature has developed the concept of Natural Area profiles, through which the country has been divided up into areas each with their own unique identity arising from the interaction of wildlife, landform, geology, land use and human impact. The unique identity of each Area confers a "sense of place" and a distinctive nature conservation character. It is envisaged that the development of Natural Areas will help to provide an improved framework from which it will be possible to secure support for wildlife and geological conservation. The Axe and Lim LEAP area lies primarily within two of these Natural Areas, namely the Blackdowns and Wessex Vales (see Map 6).

### 3. Targets for Water Quality

#### 3.1 Managing Water Quality

We manage water quality by setting targets called River Quality Objectives (RQOs). They are intended to protect current water quality and future use, and we use them as a basis for setting consents for new discharges and planning future water quality improvements.

We also manage water quality by applying standards set in EC Directives and other international commitments. Failures to comply with these standards are outlined in the issues section of this document.

We have allocated RQOs using a classification scheme known as the River Ecosystem (RE) Classification which was introduced by the National Rivers Authority, following public consultation, in 1994. It replaces a former scheme introduced by the Water Authorities in the late 1970s and used by the NRA until 1994. The RE Classification comprises five hierarchical classes as summarised below:

Table B - Class Descriptions for the River Ecosystem Classification

RQO (RE class)	Class description
RE1	Water of very good quality suitable for all fish species
RE2	Water of good quality suitable for all fish species
RE3	Water of fair quality suitable for high-class coarse fish populations
RE4	Water of fair quality suitable for coarse fish populations
RE5	Water of poor quality which is likely to limit coarse fish populations

The RQOs we set must be achievable and sustainable; we must be able to identify what needs to be done to meet the RQO and to ensure as far as practicable that water quality can be maintained at this level in the future.

Where we are unable to identify solutions or resources to resolve current water quality problems, we may also set a Long Term RQO. We will measure compliance against RQOs but use Long Term RQOs as a basis for setting consents for new discharges. This will ensure that future developments will not prevent us from achieving our long-term objectives.

These classes reflect the chemical quality needed by different types of river ecosystem, including the types of fishery they can support.

#### 3.2 Compliance with RQOs

The rivers of the Axe and Lim LEAP area have been divided into 29 classified stretches and the RQOs we have set are outlined in the table below and shown on Map 2. Where a reach does not comply with the RQO, the reasons are investigated and the necessary actions are taken to achieve compliance (see Issue 1 – Impact of effluent discharges and Issue 2 – Impact of farming).

River Name	Public stretch name	RQO	1999 Compliance with RQO	Long Term RQO	1999 Compliance with Long Term RQO
Lim Axe	Source - Mean High Water	1	C		
	A3066 Bridge Mosterton - Seaborough	2 (2000)	S		
	Seaborough - Oathill Farm Wayford	2	S	1	S
	Oathill Farm Wayford - A358 Bridge Weycroft	2	C	1	S
	A358 Bridge Weycroft - Bow Bridge	2	C	1	S
	Bow Bridge - Slymlakes	2	C		
	Slymlakes - Whitford Bridge	2	C		
	Whitford Bridge - below Whitford Abstraction	2	C		
	Below Whitford Abstraction - Normal Tidal Limit	2	C		

River Name	Public stretch name	RQO	1999 Compliance with RQO	Long Term RQO	1999 Compliance with Long Term RQO
Coly	Source - Heathayne Farm	2 (2000)	C		
	Heathayne Farm - Normal Tidal Limit	2 (2000)	C		
Umborne Brook	Source - Triffords Farm	2	C	1	S
	Triffords Farm - Coly Confluence	2 (2000)	C		
Offwell Brook	Source - Offwell	1	C		
	Offwell - Coly Confluence	2	C		
Bruckland Stream Yarty	Source - Axe Confluence	2 (2000)	C		
	Source - Newhaven Bridge	2	C	1	M
	Newhaven Bridge - Beckford Bridge	1	C		
Corry Brook	Beckford Bridge - Axe Confluence	2	C	1	M
	Rose Farm - Yarty Confluence	2	C		
Kit Brook	Source - Axe Confluence	1	M		
Blackwater River	Source - Axe Confluence	2	C	1	S
Forton Brook	Source - upstream Tatworth STW	1	M		
	Upstream Tatworth STW - Axe Confluence	2	C	1	M
Temple Brook	Source - Axe Confluence	2	S		
Clapton Stream	Source - Axe Confluence	3	C	2	M
Drimpton Stream	Source - Axe Confluence	2	S	1	S
Whetley Stream	Source - Axe Confluence	2	M		
Branscombe Stream	Source - Mean High Water	2	C		

C = Compliant

M = Marginal Failure

S = Significant Failure

Map 2 shows where current water quality fails to meet its RQO. This assessment is based on three years of routine monitoring data collected between 1997 and 1999 and held on public register. We have shown failures to meet RQOs as *significant* and *marginal*. Significant failures are those where we are 95% certain that the river stretch has failed to meet its RQO. Marginal failures are those where we are less certain (between 50% and 95%) that the stretch has failed to meet its RQO.

Of the 29 monitored river stretches in the LEAP area four stretches significantly fail to meet their RQOs, and three stretches marginally fail to meet their current RQOs. Eight stretches also failed to meet their long term RQOs. The causes of these failures are identified in Issue 1 - Impact of Effluent Discharges and Issue 2 - Impact of Farming.

### 3.3 Biological Quality

Biological monitoring is based on a group of macroinvertebrates (small animals including mayfly nymphs, snails, shrimps and worms) that are found on the riverbed. 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 chemical monitoring
- provide a picture of quality integrated over time

In 1998 25 sites were monitored in the River Axe catchment. Good biological quality was found at the majority of sites. This was shown in the diversity and pollution-sensitive nature of the invertebrate fauna. The River Axe at Axe Bridge showed some decline in biological quality. This, however, may be due to habitat changes at the site.

Some minor changes in biological quality were found at a few sites on the tributaries:

- Sewage fungus was recorded at Offwell during spring. However, there was no impact to the invertebrate fauna
- A decline in the invertebrate fauna was found on the Clapton stream in autumn; no reasons could be found for this
- At one site on the River Coly the invertebrate diversity was very much reduced, again the cause of this has not been established
- The River Yarty was found to have a decline in biotic scores at one site only: Newhaven Bridge

Biological monitoring forms part of the General Quality Assessment (GQA) scheme undertaken by us to describe the state of our rivers and is complementary to chemical monitoring.

During 2000 we will be sampling the invertebrate fauna at all routine sites along the River Axe catchment, as part of our GQA survey, which is carried out every five years. From this data a biological class will be assigned to each stretch. Comparisons will be made with past surveys to assess the biological status of our rivers and help to assess any changes in biological quality. This will also help to establish if the minor problems identified during this survey are significant. Issues arising from this work will be included in future Annual Reviews of the Axe and Lim LEAP and actions will be developed as appropriate.

## 4. Issues and Proposed Actions

### Environment Strategy

We have a wide range of environmental management and regulatory responsibilities which need to be implemented within the framework of an environmental strategy if our principal aims and objectives are to be met. Our publication "An Environmental Strategy for the Millennium and Beyond"<sup>4</sup> describes how we are taking forward an integrated approach to management of the environment across air, land and water through the implementation of nine environmental themes. They are:



Addressing climate change



Improving air quality



Managing our water resources



Enhancing biodiversity



Managing our freshwater fisheries



Delivering integrated river-basin management



Conserving the land



Managing waste



Regulating major industry

We will deliver this strategy at a local level through dialogue between ourselves and others who are involved in the protection and management of the environment. As a first step towards achieving our aims and objectives (see Section 1) and delivering our strategy in this LEAP area, we have identified a series of environmental issues and proposed actions, upon which we are now seeking comment.

These issues are presented on the following pages, with each action allocated a theme or themes. Some of these actions will have been carried over from the Rivers Axe and Lim Catchment Management Plan Action Plan. Actions will be priority rated and incorporated into our annual business plans. The priority rating of an action will affect its ability to acquire funding. Therefore, it should be noted that the inclusion of an action in an Action Plan does not guarantee that funding will be available for its programmed completion.

## Issue 1: Impact of Effluent Discharges

We regulate the disposal of effluent direct to surface or groundwater by determining and enforcing discharge consents. Discharge consents can only be used to control point source discharges, for example:

- Continuous discharges – sewage works, industrial etc.
- Intermittent discharges – sewer overflows, surface water runoff etc.
- Discharges to ground – soakaways etc.

Rivers and coastal waters can naturally render the main constituents of many effluents harmless, and with proper controls over effluent disposal the environment will not be harmed.

Effluent discharges from sewage treatment works (STW) can lead to failure of chemical targets that have been set to maintain certain levels of use e.g. water for drinking or bathing. In addition, discharges can have an aesthetic impact and cause rivers and estuaries to become enriched with increased levels of nutrients. Nutrients support the plant and animal life in water bodies, but in excess nutrients can accelerate the growth of algae that can lead to fish kills through oxygen starvation. Because we aim to maintain and where appropriate improve water quality, we have identified where discharges of sewage effluent are causing problems and what we can do to resolve them. (See also Issue 3 - Potential for Eutrophication.)

**Sewage treatment improvement plans** – The Water Companies investment programme for the period 2000-2005 is known as Asset Management Plan 3 (AMP3). AMP3 has been developed along guidelines agreed between the Environment Agency, the Department of the Environment, Transport and the Regions, the water services companies and the Office of Water Services (OFWAT). The following table shows sewage treatment works in the Axe & Lim LEAP area where improvements are to be carried out under AMP3.

Table C - Expected improvements to South West Water discharges under AMP3

Discharge	Receiving Water	Required treatment level	Investment driver(s)	Due by
Seaton STW	Axe estuary	Ultraviolet disinfection	Bathing Waters Directive to achieve compliance with guideline standards at Seaton designated bathing water.	March 2002
Beer Head	Lyme Bay	Secondary treatment of existing untreated sewage discharge	Urban Waste Water Treatment Directive (UWWTD) (Appropriate treatment).	March 2002
Tatworth STW	Forton Brook	Improved secondary treatment, an increase in sewage flows receiving full treatment, and a consent condition for ammonia to protect the RQO	UWWTD and Protection of downstream RQO.	December 2004
Dalwood STW	Corry Brook	Improvement to remove aesthetic impact of storm sewer discharges.	UWWTD (Appropriate treatment).	December 2004

There are also improvements to nine intermittent discharges to be carried out in AMP3. This includes improvements to the storm tanks at the four STWs listed in the table above and five combined sewer overflows in the catchment. Completion dates for these improvements range from 31/03/02 to 31/12/05.

We are committed to monitoring the progress of all identified AMP schemes due for completion before the end of 2005. This will essentially be through existing monitoring programmes.

**First time sewerage** - The Environment Act 1995 introduced new duties on water service companies to provide public sewers for certain domestic properties where environmental problems exist or are likely to arise. Any owners, occupiers or local authorities can apply to the sewerage undertaker to provide connection to the foul sewer. This is known as first time sewerage. We can provide information to relevant bodies, and we will act as an arbitrator in any dispute. An application is

being processed by SWWL for a first-time sewerage scheme at Thorncombe to provide sewage treatment to a number of unsatisfactory existing discharges from houses. First time sewerage is also being considered at Chilson Common, Clapton and Combyne. **Action 1a.**

**EC Bathing Water Directive<sup>5</sup>** - There are four identified EC Bathing Waters in the LEAP area - Lyme Regis (Cobb), Lyme Regis (Church), Seaton and Beer. Only two of the designated bathing waters were compliant with the mandatory standards of the Directive in 1999 (also see Issue 2 - Impact of Farming). The compliance history for each bathing water can be found in Appendix 3.

The designated bathing water at Seaton failed the mandatory standards of the Directive in 1999. The main influence on water quality at this bathing water is the River Axe and discharges into the River Axe catchment. One of the sample failures occurred following exceptional rainfall during the preceding 48 hours, exceeding the two-day 1 in 5 year storm event for the local rain gauge. Although the DETR have supported a weather waiver for this sample, the bathing water still failed the mandatory standards of the Directive because a replacement sample was not taken. Improvements to Seaton STW and sewerage further up the Axe catchment should improve water quality at this bathing water. Further investigations are underway in relation to the impact of Water Company discharges on bathing water quality. **Action 1b.**

Bathing water improvements at Lyme Regis have been brought about by a SWWL improvement scheme, which became fully operational during the 1995 bathing season. In 1999, Lyme Regis (Cobb) was compliant with the more stringent guideline standards of the Directive, but Lyme Regis (Church) was not.

Bacterial contamination of the River Lim may affect water quality at both the designated bathing waters at Lyme Regis. Investigations have identified a number of potential sources of contamination: operation of storm overflows, diffuse pollution from land runoff and inputs from wildfowl. **Action 1c.**

**RQO non-compliance** - The Umborne Brook from source to Triffords Farm significantly failed to meet its long term RQO of RE1 in 1999 as a result of elevated ammonia. In the past water quality in this stretch has been affected by a poor quality discharge from an East Devon District Council STW serving council houses in Cotleigh. This plant has now been improved and no longer affects the RQO. This stretch also receives the discharge from Wilmington Trout farm which may have an impact on water quality. Further investigations are planned to determine whether there is an impact and to what extent. **Action 1d.**

The effluent discharge from Wilmington STW is also suspected to have been having an impact on water quality recently. Following discussion with South West Water, improvements at the works are underway which should improve the quality of the final effluent.

The Temple Brook from source to Axe confluence significantly failed its RQO of RE2 as a result of elevated BOD concentrations. A combination of agricultural pollution and septic tank discharges around Greenham may have contributed to the poor water quality (see Issue 2 - Impact of Farming).

**Exceedence of EC Dangerous Substances Directive<sup>6</sup>** - The River Axe at Slymlakes exceeded the Environmental Quality Standard (EQS) for lead on a single occasion on the 25 August 1998. Other metals were also present in elevated quantities. Sampling of the discharge from Axminster STW showed that this was not the cause of the exceedence. Sample results at a site upstream of the STW were below the limit of detection for lead, and it has not been possible to find the cause of this result. There have been no further exceedences of the EQS at this site and we do not propose an action in relation to this issue.

Table 1 - Impact of effluent discharges

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
a Consider first-time sewerage at the following; Clapton, Combyne, Chilson Common and Thorncombe. 	LAs, Residents, SWWL, Agency	unknown	●	●	●		
b Seek improvements to Seaton, Beer Head, Tatworth and Dalwood STW under AMP3. 	Agency, SWWL	unknown	by 2005				
c Carry out further work to determine sources of bacterial contamination at Lyme Regis (Church) and Lyme Regis (Cobb) beaches. 	Agency, SWWL	unknown	●	●			
d Determine impact of Wilmington Trout Farm on the Umborne brook. 	Agency	unknown	●	●			

## Issue 2 Impact of Farming

Farming is the principal land use in the LEAP area, accounting for 93% of the total. A sustainable farming system which conserves the soil, minimises and recycles wastes, and conserves wildlife habitats, can bring environmental and long-term economic benefits. In many areas however, including this one, farming has a significant impact on the environment.

**Water pollution** - Although the number of substantiated pollution incidents in the South West Region in 1999 dropped by 5.5% compared to 1998, the number of farm pollution incidents increased by 13%.

Farm pollution can be either diffuse e.g. land runoff, or from point discharges e.g. field drains, poorly maintained silage clamps and slurry tanks. This pollution can change the quality of the water in rivers, which can have a significant effect on plant and animal life, the physical nature of the river system and human health.

Table D shows failures of RQOs based on data between 1997 and 1999, which are considered to be related to agriculture. Many of the failing samples were taken during rainy periods when river flows were increased, and were associated with elevated BOD or ammonia results. This strongly suggests that diffuse pollution from agriculture is having a significant impact on water quality. This area is intensively farmed and problems have been identified with overstocking, runoff from uncovered yards and poor waste-spreading practices.

Table D - 1999 RQO failures considered to be related to agriculture

River Stretch	RQO	Failure	Long Term RQO	Long Term RQO failures	Reason for failure
River Axe: A3066 Bridge Mosterton - Seaborough	2	Significant			These four stretches of the River Axe failed as a result of elevated BOD. These failures are thought to be related to diffuse agriculture pollution because the upper Axe is intensively farmed with high stocking densities in fields adjoining the river. The impact of point discharges on water quality has been largely eliminated. In particular, three farms along the stretch from A358 Bridge Weycroft to Bow Bridge have been identified as having problems. These problems are to be followed up and addressed in the near future.
River Axe: Seaborough - Oathill Farm Wayford	2	Significant	1	Significant	
River Axe: Oathill Farm Wayford - A358 Bridge Weycroft	2	RQO achieved	1	Significant	
River Axe: A358 Bridge Weycroft - Bow Bridge	2	RQO achieved	1	Significant	
Whetley Stream	2	Marginal			These three tributaries of the River Axe marginally failed their RQO or long-term RQO in 1999 as a result of elevated BOD. These failures are thought to be caused by diffuse agriculture pollution because the majority of failing samples are linked to rainy periods and were associated with elevated ammonia.
Kit Brook	1	Marginal			
Clapton Stream	3	RQO achieved	2	Marginal	
Drimpton Stream	2	Significant	1	Significant	Failure was as a result of elevated BOD. The exceeding samples are related to wet weather and also displayed elevated ammonia. Diffuse pollution from agriculture is likely to be the cause but specific problems are not known. Various farm improvements have already taken place around Drimpton.

River Stretch	RQO	Failure	Long Term RQO	Long Term RQO failures	Reason for failure
Temple Brook	2	Significant			The Temple Brook failed its RQO as a result of elevated BOD in 1999. A specific farm has been identified as a likely cause of the poor water quality and improvements at the farm are currently underway. Also, problems with septic tanks around Greenham may also be influencing water quality and these are being addressed.
Blackwater River	2	RQO achieved	1	Significant	Failure was as a result of elevated BOD. Specific causes of the poor water quality are not known but diffuse pollution from agriculture may have an impact although it is not practised as intensively as on the upper Axe.
Forton Brook: Source - upstream	1	Marginal			The stretch from source to upstream of Tatworth STW marginally failed its RQO of RE1 as a result of elevated BOD and the stretch from upstream Tatworth STW to Axe confluence marginally failed its long term RQO of RE1 due to elevated BOD. The likely causes of this poor water quality is diffuse pollution from agriculture during rainy periods and also some impact from surface drainage and surface water overflows from Chard flowing into the head of the brook.
Forton Brook: Upstream Tatworth STW - Axe confluence	2	RQO achieved	1	Marginal	
River Yarty: Source - Newhaven Bridge	2	RQO achieved	1	Marginal	The River Yarty from source to Newhaven Bridge marginally failed its long term RQO of RE1 due to elevated BOD. The cause of this failure is not known.
River Yarty: Beckford Bridge - Axe confluence	2	RQO achieved	1	Marginal	This stretch failed its long term RQO of RE1 as a result of elevated BOD. Failures are associated with rainy periods and elevated ammonia and it is therefore likely that diffuse agriculture pollution has contributed to the failure. One specific problem with a farm is currently being remedied.

**EC Bathing Water Directive<sup>5</sup>** - The failure against the mandatory standards of the EC Bathing Water Directive at Beer in 1999 was attributed to agricultural runoff following heavy rain. An investigation is currently underway to determine the appropriate remedial action required. Improvements to the Beer Head outfall and ultraviolet treatment at Seaton STW under AMP3 may also improve the water quality at this bathing water. **Action 1b.**

**Farm Waste Management** - The Upper and Middle Axe was the target of a Farm Waste Management Campaign funded by the Ministry of Agriculture Fisheries and Food (MAFF) which ran from September 1999 to March 2000. Farmers were encouraged to prepare their own farm waste management plans for the spread of manure and other similar organic wastes. These plans help the farmer to establish where, when and in what quantities farmers should apply wastes in order to minimise water pollution and maximise benefits from nutrients. Uptake for this campaign was good; a report will be published by ADAS in due course. Details of more wide-ranging initiatives are given under Sustainable Farming Initiatives below.

**Sheep-dips** - There is growing concern about the increased use of sheep-dip insecticides based on synthetic pyrethroids. Many farmers have switched to these products because of the health concerns associated with organophosphate

insecticides. However, synthetic pyrethroids are highly toxic to aquatic life particularly the invertebrates that inhabit the river-bed, (up to 100 times more toxic than organophosphates) and they have caused some serious pollution incidents in other parts of the country.

In 1998 we undertook a pilot study, located on Exmoor in the upper tributaries of the River Exe, to investigate the potential impact from the use of synthetic pyrethroid sheep-dips. The report of this study is nearing completion. Should any impacts be identified, other river catchments may be investigated, and any actions for this area will be included in future reports. Disposal of sheep-dip to land is now governed by the Groundwater Regulations 1999, as described in the Appendix under EC Directives. **Routine.**

**Pesticide use** - The acreage of maize grown in the LEAP area, largely as feed for dairy cattle, has increased in the last ten years. The growing of maize can give rise to problems associated with the use of herbicides.

Atrazine, which is used for controlling weeds in maize fields, is a persistent herbicide and low concentrations have been detected in the groundwater of some boreholes which are used for public water supplies. We have visited a number of farms in the area providing advice on the use of pesticides, which has resulted in lower concentrations of Atrazine being used, and will continue to review the levels of Atrazine and encourage farmers to use alternative methods of weed control where possible. Atrazine has been banned for concentrated use as a weedkiller, e.g. besides roads and railways.

We are part-funding an on-going study by Exeter University into the influence of Atrazine on groundwater in the Otter Valley. We will review the findings of this research to assess whether there are any implications for the Axe and Lim LEAP area. **Action 2a + routine work.**

**Sustainable farming initiatives** - If the problems highlighted throughout this issue are going to be resolved, there needs to be significant improvements to farming practice in the LEAP area. The work described in the text above will go some way to resolving these issues, but a more holistic approach is required.

Although improvements can be brought about without significant investment (and economic benefits can result) many changes to agricultural practice require financial support. With livestock farming currently facing an economic crisis, this support must be sought elsewhere. We have been involved in a number of collaborative projects across the country where external funding (e.g. European or lottery funding) has been used to help farmers to make substantial environmental improvements.

We will investigate, with others, the possibility of an externally funded project, targeted at the River Axe catchment. Such a project could improve water quality, fisheries and wildlife value of the area. In particular, when coupled with other measures in this plan (see Issue 6 –Managing our Freshwater Fisheries) such a project could help restore the salmon and trout fishery. **Action 2b.**

We are also supporting the **River Yarty Headwaters Project**, which is being run by Somerset Wildlife Trust. This project aims to raise awareness of water quality and biodiversity issues amongst farmers and landowners, in the upper River Yarty. Advice on management and funding for improvements is available. **Action 2c.**

Funding is also available to support less intensive agriculture within both the Areas of Outstanding Natural Beauty (AONB), and the Blackdown Hills **Environmentally Sensitive Area** scheme (ESA), run by MAFF.

The ESA scheme aims to “protect and enhance the wildlife, landscape and historical value of the area through the maintenance and adoption of traditional management practices”. Farmers who join the scheme receive a payment in return for less intensive farming. In conjunction with other conservation bodies we have been in discussion with MAFF to ensure that, wherever possible, our interests are reflected within the scheme. The scheme was recently subject to a five-year policy review (1999 – 2004). We raised a number of issues specifically with regard to the protection of watercourses. Although many of our recommendations have not been taken up, there has been the inclusion of an additional payment for grassland field margins with a buffer strip of 6 metres. **Routine.**

The **Countryside Stewardship scheme**, also operated by MAFF, makes payments to farmers and land managers to improve the natural beauty and diversity of the countryside. The scheme has identified particular target areas in Devon. Most notably within this LEAP area, land within the East Devon AONB has been targeted and may be eligible for funding where management involves the conservation of riverside and wetland sites, old meadows and pastures, coastal grassland, field boundaries and lowland heath. Within the West Dorset AONB, the emphasis is on field boundaries and herb-rich meadows and pasture on neutral and acid soils. **Routine.**

**Siltation** - (also see Riverbank erosion below) Changes in farming practices have led to increased silt input into rivers. Maize growing and open-air pig rearing often leave land bare during the winter, which can result in very significant

quantities of silt washing off the fields into watercourses. Livestock physically erode the banks at crossing and watering points, and limit the growth of bankside vegetation by grazing, which further reduces bank stability. The increased sediment input into the river results in the deposition of silt on the river bed. If this occurs in salmonid spawning areas, the survival of eggs laid in the gravel is severely reduced. This problem is quite widespread in the River Axe catchment and work to remove the silt from the gravels is being carried out at various locations. To reduce silt inputs, bank-side fencing schemes are being encouraged which manage cattle access to the river, and allow bankside vegetation to become established. To date only a limited amount of fencing has been carried out, as uptake by farmers has been very poor, even where funding is available. **Action 2e.**

**Riverbank erosion** - Like soil erosion, riverbank erosion has become an increasing problem in many parts of the LEAP area, often exacerbated by trampling and over-grazing by livestock, ploughing close to the riverbank, falling trees succumbing to high winds, flood events or alder root disease (See Issue 7 - Enhancing Biodiversity). There has also been a decline in general riverbank management in recent years. Bankside trees which in the past would have been managed by coppicing or pollarding, have developed full crowns and have become destabilised through heavy winds and flood events. Once they have fallen into the river they can expose riverbanks to erosion by water or livestock poaching. An important action in preventing tree loss is to identify vulnerable trees before they fall and take early remedial action.

We encourage the sympathetic management of riverbanks through coppicing, bankside fencing, installation of cattle drinking areas and planting of trees in appropriate locations. As mentioned above under Siltation, to date there has been little progress on bankside fencing schemes. However there may be opportunities through agri-environment schemes such as Countryside Stewardship and ESA incentives (see above). It should be noted that bankside fencing should be located in areas where it is not going to increase the risk of flooding due to build-up of debris. **Action 2d.**

Wherever possible, we encourage natural river processes. However, there are circumstances where erosion, for example, may not be acceptable. In these situations we encourage the use of soft engineering techniques using willows and similar natural materials, such as coir rolls and hazel bundles and have provided guidance for schemes developed on the River Axe and River Coly. The use of living willow material does require periodic maintenance, however, this can provide material for use in repairs and on other projects. The systems generally perform well and provide robust bank protection with wildlife benefits.

Some concern has also been raised regarding the loss of mature trees within the landscape through wind damage or old age. Isolated trees within fields and mature hedgerow trees are an important habitat in an arable landscape. Once lost they are generally not replaced. Similarly mature coniferous trees, such as pines, although not naturally occurring in Devon, can also be important nesting sites for birds of prey and herons. The popular garden conifer *Leylandii*, however, should not be planted; this species has minimal wildlife value and a great potential to grow at the expense of native flora. **Routine.**

Table 2 - Impact of farming

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year					
			00	01	02	03	04	
a Review results of River Otter atrazine study to assess implications for the Axe & Lim LEAP area.  	Agency	1k		●				
b Seek external funding for a project to reduce diffuse pollution in the LEAP area.  	Agency, EN Wildlife Trusts, Angling Interests, WRT	unknown	●	●				
c Support the River Yarty Headwaters Project. 	Agency, SWT, FWAG	unknown	●					
d Encourage riparian owners to undertake management of bankside trees and provide suitable conditions for development of more extensive marginal vegetation.   	Agency	unknown	●	●	●	●	●	
e Where appropriate, promote bankside fencing schemes to limit bank erosion and reduce sediment input to the river.   	Agency Landowners, Farmers, MAFF	unknown	●	●	●	●	●	

**Routine Activity**

Carrying out farm visits to promote good agricultural practice and prevent pollution.

Implementing the Groundwater Regulations to ensure safe disposal of sheep-dip.

Promoting good practice amongst maize growers, to reduce soil erosion and use of atrazine.

Discourage the planting of inappropriate bankside trees.

Ensuring, through liaison, that our interests are reflected in ESA and Countryside Stewardship schemes.

### Issue 3 Potential for Eutrophication

Raised levels of nutrients in a watercourse, particularly nitrates and phosphates, can increase the growth of algae and higher plants. If algal growth becomes excessive then the chemical, biological and aesthetic quality of a water body can be affected. This is called eutrophication.

We have published a national strategy for dealing with eutrophication, which focuses on a partnership approach to the management of this problem.

The Urban Waste Water Treatment Directive' (UWWTD) requires higher standards of treatment for discharges to "Sensitive" Areas (see Appendix 3). "Sensitive" Areas are those waters that receive discharges from sewage treatment works serving populations greater than 10,000 people and are eutrophic, or at risk of becoming eutrophic in the near future. The Department of the Environment, Transport and the Regions (DETR) determine if a watercourse is a sensitive area based on studies undertaken by us. If sites are designated as sensitive areas, we are responsible for ensuring that discharges to them are improved and will undertake follow-up monitoring.

During the period 1994 – 1996 the Axe Estuary was monitored extensively as part of an assessment to determine whether it would qualify as a Sensitive Area (Eutrophic) and a Polluted Water (Eutrophic). Seaton STW was the qualifying discharge with a population equivalent of 15,000. If inputs from the STW were found to result in eutrophication then nutrient reduction measures would be required as part of the treatment process.

Data analysis of monitoring results showed high levels of nutrients in the estuary but that these were not causing eutrophication. Modelling indicated that reducing either nitrogen (N) or phosphate (P) inputs from Seaton STW would not significantly reduce concentrations of these nutrients in the estuary. As a result the Axe estuary was not submitted for Sensitive Area (Eutrophic) status in the 1997 submissions to the DETR.

The River Axe between Wadbrook and Colyford has been put forward as a proposed SAC and is currently designated as a Site of Special Scientific Interest (SSSI). It supports particularly interesting plant communities, including the nationally scarce short-leaved water-starwort. There are concerns that the middle and lower reaches of the river may be subject to eutrophication. Plant surveys have shown some decline on diversity; one factor contributing to this decline may be nutrient enrichment, but the results were not conclusive and further work was required. We completed a study in 1999 which shows that communities within the pSAC/SSSI are not declining in this way.

We have agreed with English Nature (EN) a Special Ecosystem classification for nutrients, applicable to all riverine SSSIs. This has not yet been agreed by the DETR. A standard of 0.06 milligrams per litre of orthophosphate would be applicable to the River Axe. This is exceeded at all routine monitoring sites along the river.

There are three main sources of orthophosphates to the river: agricultural runoff, industrial effluent and sewage effluent. We have been working with English Nature to identify the relative contributions of each source to the overall nutrient levels within the pSAC/SSSI. When this work is completed, we will be able to identify the actions required to reduce nutrient inputs to the river. **Action 3a.**

Table 3 - Potential for eutrophication

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
a Investigate potential sources of nutrient inputs to the SSSI using plant surveys and nutrient data. 	Agency, EN	5k	●	●			

## Issue 4 Impact of Development

The local planning authorities control development within the LEAP area. In order to influence the location and the type of development we maintain involvement in the planning process, which we see as an integral part of our work to protect and enhance the environment. We are involved at all levels of the planning system; however, it must be recognised that our actual control over development is limited.

We welcome early contact by the local planning authorities on development plan preparation and provide support, information and guidance where appropriate. We also welcome informal approaches by local planning authorities and developers to discuss the potential impact of a proposal.

In recognition of the need to work closely with local planning authorities, we have signed a Memorandum of Understanding which outlines the general intentions of both the Local Authority Associations and ourselves to build a relationship based upon co-operation, openness and the exchange of information.

In considering responses on development plans and planning applications, we have an underlying duty with respect to sustainable development. We take the view that achieving sustainable development does not mean environmental protection at all costs, but instead, it involves encouraging environmentally compatible economic activity and discouraging or controlling environmentally damaging activities.

Increased development can put pressure on our water resources and sewage treatment works that can lead to failure of water quality objectives (see Section 3 – Targets for Water Quality and Issue 2 Impact of Farming), increase the risk of flooding, cause air quality problems and generate more waste. However, development can also bring benefits such as the redevelopment of brownfield sites and the clean-up of contaminated land. We will use the planning process to ensure that where damage does occur, appropriate mitigating measures are taken.

**Water resources** (See also Issue 5 – Impact of Water Demand) - The availability of water resources is an increasingly important issue across England and Wales. Whilst the Government has said that it does not expect water resources to be a reason for development proposals being rejected, the provision of adequate water supplies could have an influence on the timing of developments. We comment on all county and district plans, and any individual planning applications that will have a significant water use, with respect to water resources and indeed water efficiency (as all new homes are now metered water efficiency can reduce customer's bills). However we can only comment on water resources in general as the specifics depend on which sources the relevant water company would plan to use to supply the development. In the light of this we wish to see water companies added to the list of statutory consultees.

**Contaminated land** - On 1 April 2000 new regulations came into force on contaminated land. These regulations require local authorities to draw up inspection strategies to identify areas of contaminated land within their district. The full extent of contaminated land within the Axe and Lim LEAP area is not yet known. Once sites have been identified, it will be necessary to decide what remedial work is required and we will be working with the local authorities on this. Following identification it is possible that some sites will be classified as 'special' sites and this is where we will concentrate our efforts. Actions for contaminated land sites in the LEAP area will be developed once the full extent is known.

**Development and flood risk** – We advise planning authorities on development and flood risk matters. The Government expects us to ensure that planning authorities have sufficient information on flood risk matters to enable them to make informed and sound planning decisions. This information may come from us or it may have to be provided by the potential developer.

Clearly, close collaboration is required between ourselves and the planning authorities. Effective floodplain protection must recognise the conflicts which exist between development and natural uses of the floodplain, and seek to reconcile them in a way which is both balanced and sustainable. This requires taking a comprehensive, holistic view of floodplain land-use planning. To assist in this, we have produced up-to-date and consistent maps of floodplains as part of our survey duties under Section 105(2) of the Water Resources Act 1991<sup>8</sup>. The first stage of the survey, 'Level A', has now been completed and this shows the indicative floodplain areas for all the main rivers in the Axe & Lim LEAP area. The 'Level A' data has also been provided to the local planning authorities in the area.

We have now started work on the 'Level B' studies. These concentrate on specific areas of proposed development or those that are sensitive to flood risk. They involve a greater amount of hydraulic modelling and investigation. Because the 'Level B' studies are more closely related to development closer liaison and consultation with the planning authorities will be required. We do not currently propose to carry out any 'Level B' studies in this LEAP area.

**Flood warning** - Flooding can happen very quickly, often with little warning. Whilst the risk of flooding can be reduced by defences, floods are a part of a natural process and can never be eliminated entirely. We make every effort to issue

warnings to people who are at risk from flooding by rivers and the sea, but it is also the responsibility of property owners to take any action necessary to protect themselves and their property. We have set up a new telephone service to provide up-to-date advice and information to those at risk of flooding. The service is called **FLOODLINE 0845 9 88 11 88** and is available 24 hours a day, 365 days a year.

Flood warnings are currently provided within this LEAP area on the Rivers Axe, Coly, Yarty and the Corry and Umborne Brooks. Tidal flood warnings are issued for the South Devon Coast.

A Major Incident Plan for warning of and responding to flooding in Seaton has been prepared by the Devon County Emergency Planning Officer and will be triggered by warnings from us. This Plan was completed in January 1999.

A study into the current levels of service provided by Fluvial Flood Warning across the region on main rivers is being conducted and will enable levels of service to be compared across the whole South West Region. The study will identify priorities for improvements and a programme of future work, together with costs, will be produced. As far as the recipients of flood warnings are concerned the feedback is of a service well received. We liaise with members of the public who receive direct warning and also local authorities and the emergency services on a regular basis. **Action 4a.**

**Air quality** - In 1990 the Government published a National Strategy for Air Quality including a framework of standards and objectives for the pollutants of most concern and a timetable for achieving objectives. Local authorities are obliged to carry out periodic reviews of air quality in their areas. Where standards are not being met, or are not likely to be met by 2005, they are required to designate local air quality management areas and make action plans to improve air quality in these areas. All the local authorities which cover the Axe & Lim LEAP area have carried out Stage I reviews to assess the status of air quality and they are now carrying out Stage II reviews where required. Air pollution can damage flora, fauna and buildings and can have significant effects on soils and water. Some species, particularly lichens, are susceptible to air pollution, mainly by sulphur dioxide. Levels of Sulphur Dioxide in the LEAP area are low and are not expected to increase (see Issue 7 - Enhancing Biodiversity).

We are only responsible for the control of major industry through our regulation of emissions to air from Part A processes. Local authorities are responsible for the regulation of smaller, less complex (Part B) industrial processes and reducing traffic pollution. There are no Part A processes in the LEAP area and we therefore do not propose any actions in relation to this issue.

**Protection of the Historic Environment** - The LEAP area contains many sites and features of historic and archaeological interest. Although there is a wealth of information from a wide range of sources on the archaeological and historic value of the area, it is not in a useable format. Many organisations would benefit from the production of a simple document based on a rapid archaeological assessment of the wider area. This could cover either the wider LEAP area or fit political boundaries. There is also a possibility that submerged features may be damaged by our work, particularly in areas close to known archaeological sites. **Action 4b.**

The Taunton Stop Line has been identified as an important feature of the area. This Second World War defence has been studied and recorded as part of the Defence of Britain Project. Some of the pill-boxes are close to the River Axe and are being undermined by erosion, creating a potential for both the loss of a historic feature and obstruction to flow. **Action 4c.**

The River Lim has a leat at Middle Mill Weir that is reported to be of historic and amenity value. Lyme Regis Town Council is keen to see if this leat could be reinstated. **Action 4d.**

Table 4 - Impact of development

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
a Complete review of flood warning standards of service and where necessary improve flood warning at some locations.  	Agency	21k*		●			
b Lack of archaeological information in a useable format - discuss options for a rapid archaeological assessment of the whole LEAP area with potential partners. 	DCC, Agency, EDDC, DAS, AVCS	<1k	●	●			
c Review Defence of Britain Project to identify any actions for the Agency regarding pill-boxes. 	Agency	<1k	●	●			
d Examine feasibility of reinstating leat at Middle Mill Weir, taking account of environmental water resources and flood defence considerations. 	Lyme Regis Town Council Agency	<1k	●	●			

\*These costs are for the South West Region as a whole.

## Issue 5 Impact of Water Demand

Water is an essential but finite resource. One of our roles is to protect the water environment (rivers, lakes and wetlands) from over-abstraction whilst considering the needs of the public, agriculture and industry, for water. We therefore manage water resources to achieve the right balance between the needs of the environment and those of the abstractor. We are guided in this by EU and UK legislation.

Consumptive abstractions use most of the abstracted water with little returned to the original point of abstraction. Examples are public water supply, industrial processing or evaporative cooling. Non-consumptive abstractions use only a fraction of the quantity of water abstracted and return the remainder to the vicinity of the abstraction point. Examples of non-consumptive abstractions are fish farms, hydroelectric power schemes and amenity features such as ornamental lakes.

**Managing Current Demand** – Water resources management and maintaining reliable public water supplies within the LEAP area and beyond are subject to national legislation and regulation. Primarily this is achieved through the system of abstraction and impoundment licences, determined and administered by the Agency. Abstraction licences authorise removal of specific volumes of water over stated timescales, from specified sites for specific purposes. Additional conditions may be included to further constrain or control the operation of the licence to ensure that environmental impacts are minimised or negated.

This system of licensing is common to England and Wales and was reviewed during 1997/98 and a number of changes were proposed. 'Taking Water Responsibly', a paper detailing the Government decisions following consultation, was published in March 1999. The changes proposed will fundamentally affect the way in which the Agency will control the abstraction, transfer and impoundment of water in England and Wales in future. This in turn will alter the way in which abstractors and other interested parties are involved in the control and management of water resources. During the implementation of the proposals we will want to reassess the changes with abstractors and interested groups or individuals. In particular, we will discuss how we will implement the changes and how the changes might affect existing operations.

Initially we are concentrating on the following areas which do not require primary legislation changes:

- Catchment Abstraction Management Strategies (CAMS)
- Time limiting of licences
- Restoring sustainable abstractions by dealing with damaging abstractions.
- Review of licence administration procedures

Further information on these matters is provided in the leaflet 'Changes to the water abstraction licensing system' which is also available from our customer contact staff in our Devon Area Office.

**Public Water Supply** – Planning and management of public supplies is based on areas known as water resources zones. These zones have an integrated network of pipes and sources and can extend over large areas, often encompassing several river catchments, LEAP areas and administrative areas. As a result, it is often difficult to provide data relating to public water supply which is specific to a particular LEAP. The majority of the LEAP area lies within part of South West Water's Wimbleball Resource Zone which extends over East Devon and the lower Exe catchment. The part of the LEAP area in the upper reaches of the Axe and Lim forms a small part of Wessex Water's Northern and South Resource Zones.

**Meeting Future Demand** – Expenditure on water company infrastructure serving the LEAP area is dependent upon the periodic review of prices which was published by OFWAT at the end of November 1999 and covers the period 2000–05. (See Issue1 - Impact of Effluent Discharges.)

As part of their submissions to OFWAT, water companies were required to revise their demand forecasts, review their resource availability and consider potential options to meet any deficits within the planning horizon to 2010. In parallel with this, we required water companies to submit water resources plans for the period to 2025. These were received by us in March 1999. We considered the plan submitted by both South West Water Ltd and Wessex Water Ltd to be acceptable. All companies are now to review and update the plans annually.

Before any new resources can be developed or existing resources developed further, we must be satisfied that water companies have looked in detail at a range of appropriate options. These include encouraging people to use water more efficiently (demand management), increasing the efficiency of uses of sources (resource management) and increasing efficiency of pipe networks (distribution management), as well as reducing their leakage towards an acceptable level. Each year, OFWAT set leakage targets for each water company which they are bound to meet, although they can set lower

targets if they wish. The water companies also have a duty to promote efficient use of water and are required by OFWAT to publish water efficiency plans.

Metering supplies, and appropriate tariff structures provide a mechanism to encourage the efficient use of water. All water companies in England and Wales are now obliged to install a meter free of charge to any domestic customer that requests one.

**Non-public water supply abstractions and demand** - It is possible that there may be local environmental problems associated with full future uptake of private abstractions in the LEAP area. We will continue to monitor the net use of licensed water abstractions and its effects. Future abstraction needs are assessed through abstraction licensing procedures. These take into account the justified need for water and in future will need to include the demonstrated extent of the provision of water-efficiency measures within the proposals.

The Agency is now developing new national and regional water resources strategies to cover both public and non-public water demands with a planning horizon of 2025. Consultation for this closed at the end of January 2000. Publication of the national strategy is scheduled for December 2000 with the regional strategy to follow in January 2001.

Overall the area is not at risk of over-abstraction. However, one localised problem has been identified in the Umborne Brook at Wilmington Trout Farm. At this site there is a deprived reach of river of approximately 200 m in length. During the late spring to autumn the majority, if not all, of the flow is diverted from the brook, limiting fish movement. The owner of the trout farm was granted an abstraction licence when fish farms became licensable in the late 1980s. At that time the licensing authority, the NRA, was obliged by law to licence the continued deprivation of this stretch.

The Government expects us to review and where appropriate take remedial action within a specified timescale, to alleviate certain damaging abstractions. We are currently working with the holder of the abstraction licence for Wilmington Trout Farm to enable measurement of the abstraction for enforcement purposes. We will seek to alleviate the issue via current and any revised legislation. **Actions 5a, 5b.**

**Catchment Abstraction Management Strategies (CAMS)** - This major national initiative will provide the opportunity, at a local river catchment level, for groups and individuals to contribute to the development of the strategy for water resources management to be adopted for the LEAP area. CAMS will provide information on:

- the availability of water in an area
- licensing practice in dealing with new applications
- changes needed to the abstraction regime in the area to achieve the sustainable long-term use of water resources
- a transparent basis for planning by abstractors, the Agency and all other interested parties
- It will also be the vehicle for reviewing existing time limited licences

Our proposals for the production of CAMS went to national public consultation from 1 April to 31 July 2000 using the document 'Managing Water Abstraction: Towards a Shared Strategy'. After consideration of all the comments from this exercise, we will publish a National Support Document in April 2001, and then start work on the first Catchment Abstraction Management Strategy. In Devon Area we hope to publish our first Area CAMS in April 2002. These will be published one at a time on a six-year rolling cycle. **Action 5c.**

Table 5 - Impact of water demand

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
a Low flows in the Umborne Brook – complete calibration work to enable precise gauging of abstraction.  	Agency	<1k	●				
b Seek to remedy issue of deprived reach by agreement at Wilmington Trout Farm.  	Agency, owner	unknown	●	●	●	●	
c Implement CAMS for the LEAP area.  	Agency	unknown	●	●			

## Issue 6 Managing our Freshwater Fisheries

Sea trout and brown trout are widespread throughout the River Axe catchment, whilst dace and roach are found in the lower reaches of the river although their numbers have declined markedly in the past 20 years. Much of the spawning of both species takes place in tributaries of the main river, most importantly the River Yarty. Angling for both is widespread on the Axe and most of its major tributaries. The extent of the River Lim fishery is restricted by the size of the river, although wild brown trout are common. A few sea trout are known to enter the Lim, but barriers in the system severely limit upstream migration. Bullheads, stone loach, minnows and eels are also found at most locations.

**Salmon management** – Up until the mid-1960s, the River Axe Catchment supported a major salmon run. Over the past 30 years there has been a dramatic decline with returns from the rod fishery being reduced to almost nil. There has been some recent evidence to suggest that a small number of salmon may be returning to the river. It is probable that this is as a direct result of works carried out by the NRA in a rehabilitation programme that commenced in 1990-91. We will attempt to build on these improvements by carrying out a programme of habitat improvements and fish stocking in conjunction with angling interests and riparian owners.

A smolt-rearing pond, established in the Axe catchment, successfully produced several thousand smolts that were released into the catchment in the spring of 1999 and 2000. The pond is currently stocked with several thousand juvenile salmon originating from the Exe catchment, several thousand more juveniles will be introduced to the pond in 2001. **Action 6a.**

Concern about the impact of sediments on the salmonid fishery is addressed in Issue 2 – Impact of Farming in the section on Siltation.

**Barriers to fish movement** - In the River Axe there are several major weirs, of which only some are passable to migrating fish. (See Map 5)

Both Lexhayne Weir and Wilmington Weir on the Umborne Brook are major obstacles to fish migration with passage only possible during very high flows; high-quality spawning areas are located above the weirs so making them passable to migrating fish is important. Funding has been secured for works to Lexhayne Weir, and it is hoped that the necessary improvements will be carried out during 2000/2001. Of lower priority are other structures within the river catchment, which are less significant because the quality of spawning areas above them is poor. It must be considered, however, that improvement in water quality may increase the spawning potential of these areas and the priority for the installation of passes may alter.

'Irish Bridges', built to allow crossing points, are present on several smaller streams within the river catchment. The structures can become blocked preventing fish migration. We restrict the construction of new 'Irish Bridges' particularly in sensitive areas, and we will seek to modify or remove problematical structures. Somerset County Council have recently replaced the Irish Bridge at Bishopswood with a structure which will not get blocked.

In most cases we will have difficulty in funding the installation of fish passes, and we will be largely dependent upon external funding or collaborative projects to ensure their completion. **Actions 6c, 6d + Routine work.**

**Brown trout fishery** - There has been a decline in the brown trout fishery on the River Axe, although rod catch returns suggest that the situation in more recent years may be improving. A similar decline has been reported on other Devon rivers in recent years, and as a result we are working in collaboration with the Wild Trout Society to carry out research to investigate the reported problem. The first phase, which commenced in April 1999, demonstrated that a decline in mature trout was evident in the River Axe catchment. The River Axe is now included in the second phase of the project, which seeks to identify causes of the decline, and recommend solutions.

Until five years ago, some riparian interests within the area stocked stretches of the River Axe with farmed brown trout from various sources. This practice may have a detrimental effect on the native population by creating competition for food and available habitat, and increasing predation of juveniles. Furthermore, the introduction of farmed fish will modify the genetic integrity of stocks native to the rivers when farmed fish breed with wild fish. The farmed fish may also be more susceptible to disease, which could then be passed on to the native population. It is important to protect the integrity of native stocks and we discourage any stocking with non-native brown trout whilst promoting habitat improvements, the preferred method of improving the fishery. **Action 6e + Routine work.**

**Coarse fishery** - Survey data from the 1970s showed that the middle and lower reaches of the River Axe supported large stocks of coarse fish, mainly dace and roach. In recent years there has been a decline both in numbers and size of populations especially of the larger fish. During 2000 a number of sightings of large pike were reported in the Lower Axe. It is possible that these fish were illegally introduced and could pose a threat to native fish stocks. We have since removed several pike from the river, and transferred them to more appropriate waters. An electric fish survey of the lower reaches

carried out during the summer of 2000 demonstrated that the river supports only a very limited number of coarse fish.

**Action 6f.**

**Rainbow trout** - There are a number of rainbow trout farms in the LEAP area that have on several occasions suffered from loss of stock. The escaped rainbow trout, which are commonly caught by anglers, compete with native stocks for food and habitat, and in the case of larger fish will predate directly on juvenile salmon and trout. Certain abstractors, including fish farms, are required by law to install screens at their abstraction points. We will work with owners to ensure screens are installed and operated to prevent both the escape of fish into the river and fish being drawn into the intake. **Routine.**

**Fish-eating birds** - It is widely felt in angling circles that in recent years there has been a marked increase in the extent of predation by fish-eating birds on freshwater fisheries. The number of cormorants observed frequently in the middle and lower reaches of the River Axe is concerning local anglers. Salmonid species may be vulnerable to fish-eating birds and are thought to be taken by cormorants in a number of locations in the area. The final results of a four year research programme into the impact of fish-eating birds has recently been published. MAFF, DETR and selected organisations will meet to establish whether the current government policy needs to be revised in the light of the report's findings. We will only be in a position to determine our own approach to the recommendations made in the report once this review has taken place and until then will continue to oppose licensed killing of these birds as a means of preventing loss of fish stocks. **Action 6g + routine work.**

**In-river works** - There have been a number of instances recently of riparian owners excavating the river channel flowing through their land. Many of these works do not require our consent, and can cause serious damage to the fishery by destroying spawning beds and nursery areas. We are seeking changes in legislation to increase our control over these activities. **Action 6h + routine work.**

**Illegal fish capture** - The decline in fish runs is also linked to high levels of salmonid poaching in adjacent coastal waters and some poaching in the estuary with fixed gill nets. Prior to the 1980s, this was a major issue and large numbers of nets were operated along the coast ostensibly for the capture of sea fish. Changes in legislation have resulted in the creation of areas closed to netting, which together with increased levels of enforcement have substantially reduced illegal capture in coastal waters. **Routine.**

#### Routine Activity

Improving conditions for fish migration wherever possible using low cost solutions.

Ensuring fish farms install and operate screens to prevent fish escape and entrapment.

Working with fish farm owners to prevent fish escape.

Removing escaped rainbow trout from areas downstream of fish farms recovering costs where appropriate.

Discouraging stocking of farmed brown trout for angling and refusing permission to stock where discrete brown trout populations exist.

Promoting habitat improvement as the preferred means of improving the fishery.

Working with owners and anglers to establish the facts where an application to cull cormorants is being considered.

Persuading riparian owners not to remove gravel from the riverbed, or limiting the extent of the operation.

Conducting regular coastal patrols in East Devon, enforcing areas closed to netting.

Routine juvenile salmonid monitoring programme. Catchment surveyed every three years.

Action Table 6 - Managing our freshwater fisheries

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
a Continue salmon stocking programme. 	Agency, Riparian and Fishery Owners	16k	●	●	●	●	
b Continue programme of habitat improvements including gravel rehabilitation. 	Agency, RFOs	2k p.a.	●	●	●	●	●
c Install fish passes, according to regional priority, on Lexhayne Weir and Wilmington Weir. 	Agency, Riparian owners, angling associations	6k & 9k		●	●	●	
d Seek to have existing 'Irish Bridges' that restrict fish passage removed or replaced. 	Agency, County Councils	<1k p.a.	●	●			
e Include the River Axe in the current Agency/Wild Trout Society investigation into the decline of brown trout in Devon rivers. 	Agency, Wild Trout Society, RFOs, Anglers	unknown	●	●			
f Investigate status of roach and dace stocks, particularly of larger fish, including surveys of middle and lower reaches to assess current coarse fish populations. 	Agency, Fishery associations	2k		●			
g Establish Agency approach to the issue of fish-eating birds following MAFF/DETR decision regarding government policy in the light of R&D findings. 	Agency, MAFF/DETR	unknown	●	●	●		
h Pursue changes in law to allow increased control of in-river works where damage to the fishery is likely to result. 	Agency	<1k	●	●			

## Issue 7 Enhancing Biodiversity

Biodiversity, or 'the variety of life', is being lost. In the UK alone over 100 species have been lost this century. The global decline in biodiversity was recognised at the Rio Earth Summit in 1992, where the Biodiversity Convention was signed by 150 world leaders. Since then Biodiversity Action Plans have been produced in the UK to protect and enhance biodiversity, initially at a national level and subsequently at regional and local levels, with increasing levels of detail. These plans focus on the nation's threatened and declining species and habitats, and include information on status, causes of decline, objectives, targets and costed actions. We have worked to incorporate targets from these plans into our LEAP documents.

We have taken responsibility, as lead organisation, for 34 species and 5 habitats of wetland character. Of these we know that otters occur within the LEAP area and river shingle beetles are also present. Other species listed within the national Action Plan require specific actions by us as a responsible body; these include the marsh fritillary and the pipistrelle bat, also found within the LEAP area.

We will ensure that actions are delivered either through existing operational programmes, policy framework or through the development of new policies, procedures or R&D projects. In addition, we also play an important part in controlling and undertaking work likely to affect a range of habitats and species at a local level and will use our influence to protect and enhance biodiversity. A summary of species considered of particular importance within this LEAP area is given within Table E.

Biodiversity can also be protected through the designation of sites. Within Europe, the Habitats Directive was devised to protect nature conservation interests throughout the continent through the establishment of a series of sites known as the Natura 2000 network. The sites are designated under either the Habitats Directive<sup>9</sup> as Special Areas of Conservation (SACs) or the European Wild Birds Directive<sup>10</sup> as Special Protection Areas (SPAs). The Habitats Directive is now implemented through the Conservation Regulations 2000, and requires that all Competent Authorities use their powers to ensure that sites are maintained at favourable conservation status. The coastline of the LEAP area is considered of particular wildlife and geological/geomorphological importance and much is protected under European legislation (see under relevant habitat).

In addition to the internationally protected sites within the area, there are sites of national conservation importance which are protected under the Wildlife & Countryside Act 1981, being designated as National Nature Reserves or Sites of Special Scientific Interest (SSSI). English Nature has also identified Lyme Bay as a Sensitive Marine Area. This is a non-statutory designation drawing attention to the importance of the marine animal and plant communities. In total, 27 subtidal marine areas have been identified around England.

Sites of importance at county level are designated as either County or Local Wildlife sites and may also be designated as Local Nature Reserves (where additional protection can be afforded through byelaws). Whilst County Wildlife Sites are afforded no statutory protection, local authorities generally recognise their importance, which will be reflected within appropriate policies within their Local Plan conferring various degrees of protection. In addition under Article 10 of the Habitats Directive<sup>9</sup> (see above) member states are also required to encourage the management of linear features such as watercourses and hedges which often provide a corridor link between important habitats. Government guidance is also given within Policy Planning Guidance for Nature Conservation (PPG 9), which describes how Government policies for the conservation of our natural heritage are to be reflected in land-use planning.

Table E - Key habitats and species in the LEAP Area

Key Habitats/Associated Species/Geomorphological features	Reason for Inclusion	Current perceived threat to habitat or species in this catchment, other than habitat loss
<b>Wet woodland</b>	Nationally important	Clearance, grazing pressure, inappropriate management, air pollution.
<i>Pipistrelle bat</i> <i>Invertebrates</i> <i>Lichens</i>	Declining populations Rich communities Declining	
<b>Spring-line mire/Rhôs pasture</b>	Nationally threatened	Lack of/inappropriate management of, habitat fragmentation, agricultural improvement/intensification, afforestation, pond creation.
<i>Marsh fritillary</i> <i>Curlew</i>	Threatened in UK & Europe Declining in UK & Europe	Disturbance Disturbance
<b>Rivers, streams &amp; fluvial processes</b>		Loss of riparian habitat/geomorphological features through neglect, inappropriate/lack of management, Alder root disease, invasive alien plants.
<i>Otter</i> <i>Water vole</i> <i>Sand martin</i> <i>Kingfisher</i> <i>Atlantic salmon</i> <i>Bullhead</i> <i>River, brook and sea lamprey</i> <i>Medicinal leech</i> <i>Short-leaved water-starwort</i> <u><i>Exposed Riverine Sediments (ERS)</i></u>  <u><i>River channel features</i></u>	Threatened in UK & Europe Nationally threatened Declining in UK & Europe Declining in UK & Europe Internationally threatened Internationally threatened Internationally threatened Nationally rare Nationally rare Wildlife value not yet fully understood Wildlife/geomorphological value	Road deaths, disturbance Predation by mink Bank protection work, excessive erosion Bank protection work, excessive erosion Climate change/possible international exploitation Threat not fully understood Threat not fully understood Unclear Unclear Inappropriate in-river works, lack of understanding of importance. Inappropriate in-river works
<b>Standing open water (including ponds)</b>	Nationally threatened	Loss through neglect or infilling, loss of conservation value through fish/waterfowl stocking, invasive alien plants.
<b>Coastal &amp; floodplain grazing marsh</b>	Nationally threatened	Agricultural intensification, nutrient enrichment of ditches, unsympathetic water level management.
<i>Curlew</i> <i>Lapwing</i>	Declining in UK & Europe Declining in the UK	Disturbance Disturbance
<b>Reedbed</b>	Nationally rare	Lack of management.
<b>Estuary &amp; associated habitats</b>	Internationally threatened	Climate change/sea level rise, siltation.
<b>Rocky seabed &amp; foreshore</b>	Vulnerable habitat	Recreational pressure, pollution by oil and other contaminants.
<i>Pink sea fan</i>	Nationally scarce	Mechanical damage from fishing gear.
<b>Sea cliffs &amp; slopes</b>	International scientific & educational importance	Recreational pressure, lack of awareness of geological importance.

We would like to see increased importance given to preserving the continuity of the floodplain and river corridors for environmental purposes in local plans. **Routine.** We would also like to work with others to establish a set of criteria which could be used to designate rivers and streams as County Wildlife Sites. **Action 7c.**

Table 7 - Designations

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
<p>a Review all existing permissions for the cSACs in the LEAP area to identify which are likely to have a significant effect on the sites.</p> 	Agency	unknown	●	●	●		
<p>b Conduct assessments on identified permissions to establish any adverse effects.</p>  	Agency	unknown			●	●	●
<p>c Establish criteria for designation of rivers and streams as County Wildlife Sites and examine potential for creating demonstration sites for best working practice.</p>  	Agency, DWT, EDDC	unknown	●	●	●	●	●

The remaining actions in this section are divided into relevant habitats. Where possible measurable targets have been included to help us assess progress with our action for biodiversity.

**Wet woodland** - This is a characteristic feature of the south-west landscape due to the wet climate and characteristically heavy soils. The habitat often contains a rich ground flora, with a diverse assemblage of associated invertebrate (particularly flies) and lichen communities. The invertebrate interest of wet woodland in turn attracts other wildlife such as the pipistrelle bat, a widespread species which has nevertheless experienced a significant decline in numbers during the last century. We do not have a full picture of the extent of wet woodland within the area, although it is generally most abundant in the upper reaches of the river catchments. Farming is generally less intensive here and many damp areas are often inaccessible and not easily drained. Nevertheless grazing pressure and clearance through agricultural improvement have contributed to an overall decline in the extent of wet woodland within the area. **Actions 8a, 8b, 8c.**

*Target: Recreate 5 hectares (ha) of wet woodland (subject to amendment following further information on area resource) by 2005.*

Table 8 - Wet woodland

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
<p>a Promote and implement actions from the Devon BAP for wet woodland by assisting with assessment of extent of resource, seeking potential new sites and promoting use as buffer strips.</p>   	EN, DWT, Agency, MAFF/FRCA, FWAG, NFU, CLA	<1k p.a.	●	●	●	●	●
<p>b Identify areas of river valleys where tree planting can be encouraged without adversely affecting flood risks.</p>   	Blackdown Hills Project, Agency	unknown	●				
<p>c Create new areas of wet woodland through planting and appropriate management.</p>   	Blackdown Hills Project, Agency	Dependent on action 8b		●	●	●	●

**Rhôs pasture** - The heavy soils of the Blackdown Hills, strongly influenced by clays and a wet climate, support a diverse mosaic of habitats linked by wet conditions known as Rhôs pasture. Particular features include the springline mires, often in association with heathland and the mires (known as fens) of West Dorset. Rhôs pasture is an internationally important species-rich wet grassland with 80% of the national resource occurring within Devon. The habitat has declined dramatically this century and it is clear that agricultural improvement and lack of appropriate management has been a major factor in this decline.

Sites like Yarty Moor (part of Deadmans SSSI) just south of Taunton, support a number of noteworthy species including the marsh fritillary, white-beaked sedge, pale butterwort and oblong-leaved sundew. We have been supporting work with the Somerset Wildlife Trust to manage this site. Other species likely to benefit from this work include curlew and barn owl.

**Actions 9a, 9b, 9c, 9d and 9e.**

*Target: Restore 20 ha of spring-line mire habitat on appropriate sites (e.g. Blackdown Hills) by 2005, maintain or restore a minimum of one large population (1000+ adults) of marsh fritillary in the Blackdown Hills by 2005, increase numbers of breeding curlew by 1 or more pairs (currently c5 pairs in the Blackdown Hills) by 2010.*

Table 9 - Rhôs pasture

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
<p>a Promote and implement actions from the Devon BAP for Rhôs pasture by encouraging sympathetic management and/or restoration of sites. Also discourage inappropriate creation of lakes/ponds within Rhôs pasture.</p> 	DWT, EN, Agency, Blackdown Hills Project, SWT, FWAG	<3k p.a.	●	●	●	●	
<p>b Promote and implement actions from the Devon BAP for fens.</p>  	DoWT, Agency, FWAG	unknown	●	●	●	●	
<p>c Promote and implement actions from the Devon BAP for curlew and marsh fritillary by promoting sympathetic management and restoration of breeding sites.</p> 	DWT, Blackdown Hills Project, SWT, EN, Agency, MAFF/FRCA, BC, FWAG	1k p.a.	●	●	●	●	
<p>d Promote and implement actions from the Devon BAP for barn owl by promoting appropriate management of riparian feeding habitats and providing nest boxes to encourage recolonisation.</p> 	Agency, BOT, SWT, FWAG landowners	1k p.a.	●	●	●	●	
<p>e Support measures from the National Fen, Carr, Marsh, Swamp &amp; Reedbed Habitat Statement, and enter 80% of Rhôs pasture area resource into protective management by 2005.</p>  	EN, Blackdown Hills Project, FWAG, Agency	3k p.a.	●	●	●	●	

**Rivers, streams and fluvial processes** - The LEAP area supports a diverse range of in-stream habitats and species. Already a SSSI, the River Axe from Wadbrook to Colyford (approximately 13 kilometres) has also been proposed as a SAC. The site supports an exceptionally diverse aquatic and marginal flora, with an interesting assemblage of plant communities in the upper reaches usually confined to the sandstone areas in Scotland. Species of particular note within the site include short-leaved water-starwort (*Callitriche truncata*), a nationally scarce species more usually associated with ditches. The river also supports diverse invertebrate communities with Medicinal Leech (*Hirudo medicinalis*) being of particular note. This species is a priority species within the UK Biodiversity Plan, with only 20 isolated populations remaining within the UK. The SSSI also contains areas of particular geomorphological interest.

Geomorphological interest within the LEAP area is not restricted to the River Axe SSSI. Many of the rivers in the area demonstrate excellent examples of ongoing fluvial processes driven by erosion and deposition including meanders, eroding cliffs and oxbows. It is important that these processes are allowed to continue wherever possible, provided that important man-made or natural assets are not at risk. **Action 10a.**

It has been recently recognised that areas of sand and gravel ("shoals") deposited by the river, termed Exposed Riverine Sediments (ERS), are particularly valuable as habitats for invertebrates (especially beetles). These sediments are vulnerable to erosion control works and some flood defence activities. We are currently undertaking research to improve understanding and to develop appropriate policy to protect these features.

A survey has been undertaken of the invertebrates, particularly beetles, found in exposed riverine sediments on a number of rivers in Devon and Cornwall. The exposures studied on the River Yarty had a high species diversity with many species found only within this type of habitat. We are continuing to undertake research and development to improve our understanding and develop appropriate policy to protect these features. **Action 10b.**

*Target: Produce policy and practical guidelines for the protection of ERS.*

There are a large number of species of conservation concern found within the LEAP area. Otters have partially recovered in numbers from the major decline of the 1960s and 1970s. We will continue to monitor the situation regarding road kills which represent one of the greatest potential threats to an eastward expansion of otters from the west of the county. In addition to identifying road death blackspots, we collect otter road casualties to undertake post-mortems on retrieved corpses. This helps us to gain an understanding of the general health of the population, particularly with regard to the build-up of pesticides and other contaminants within the body. In addition otter surveys are being undertaken by volunteers in Devon, Dorset and Somerset, providing valuable information on distribution within the LEAP area. Otters have been recorded on the Axe, Yarty and Coly. **Action 10c.**

*Target: Restore breeding otters to 1970s distribution (following further investigations into potential factors limiting their expansion to river sub-catchments) by 2010.*

We are concerned about the status of the water vole across the area. Surveys at previously positive sites in the River Exe catchment have all proved negative. We are aware of one record in the River Axe catchment from the 1996/97 survey undertaken by the Dorset Wildlife Trust; however, the current position is unclear. The Trust will be undertaking another survey in 2001 which we will support. In addition, we urgently need reports of any sightings, particularly from anglers. The slow recolonisation of the area by otters may help to displace mink, which have been instrumental in the catastrophic decline of the water vole, along with habitat loss. **Action 10e and 10f.**

*Target: Identify current water vole status in the area by 2001 and restore 2 km of suitable habitat by 2005.*

Many bat species use river corridors for feeding and roosting. We, therefore, have a particular interest in ensuring that river management and water quality control takes full account of their needs. **Action 10d.**

*Target: Ensure protection of all known roosts and achieve a 30% increase in Greater horseshoe bat populations in area by 2010.*

Both sand martins and kingfishers breed within the LEAP area. Breeding sites can be vulnerable to riverbank erosion control and other river maintenance activities, which may not only destroy nests but also stabilise eroding faces, leading to abandonment of sites. Where possible, we will work to ensure favourable status for these species.

The Atlantic Salmon is a species of international concern and whilst the precise cause of its decline is not known, it is believed that changes in temperature patterns in the North Atlantic, as a result of climate change, may be responsible (for actions see Issue 6 – Managing our Freshwater Fisheries).

*Target: Maintain and increase 1997 salmon population in River Axe by 2001.*

The exact status of the endangered brook, river and sea lamprey within the LEAP area is unknown, although lamprey (species not verified) have been recorded within the River Coly and tributaries of the Axe and Yarty. As part of our routine fish surveys we need to determine the status of each of the three species and determine whether any action is necessary to ensure the conservation of this species. **Routine.**

*Target: Determine the status of Lamprey within the area by 2000.*

We are aware that signal crayfish have been found on the River Lim north of Uplyme, however the native freshwater white-clawed crayfish has not been recorded within the LEAP area. We do not therefore believe that there is a threat of the

fungus 'crayfish plague' being spread across the LEAP area, provided these populations of signal crayfish remain localised in the immediate area. The Lim does not lie within a "No-go" area (designated by MAFF) and the keeping of signal crayfish is therefore not forbidden. We will monitor the situation in case this population appears to be spreading. **Action 10g.**

In recent years there has been a significant spread of a number of non-native invasive plant species throughout the LEAP area. Several plants are causing concern, particularly along river banks; they include Japanese knotweed (*Reynoutria japonica*) and Himalayan balsam (*Impatiens glandulifera*), which have spread along many watercourses. Whilst Himalayan balsam is now so widespread that control would be impossible, the distribution of Japanese knotweed is more localised and we encourage control. Contact must be made with us before undertaking herbicide control in or near watercourses. We are currently investigating the extent of Japanese knotweed and giant hogweed (*Heracleum mantegazzianum*) within Devon and would like to receive records from the public. Giant hogweed is a potentially dangerous species which can cause blistering of the skin, when exposed to sunlight. We are aware of one site where this species occurs within the area, namely on the River Lim, and have advised on control. It is likely that the species occurs elsewhere within the area. **Routine.**

Similarly, we are also concerned about the spread of many non-native aquatic species, which are widely available to the public, species such as parrot's feather (*Myriophyllum aquaticum*), Australian swamp stonecrop (*Crassula helmsii*), floating marsh-pennywort (*Hydrocotyle ranunculoides*) and water fern (*Azolla filiculoides*). Many of these species are vigorous growers and once released into the wild can spread rapidly at the expense of our native flora, reducing biodiversity. We will continue to work to have these plants withdrawn from sale and canvass nationally for appropriate changes in legislation. **Routine.**

*Target: Prevent the spread of aquatic non-native invasive plant species. Restrict the spread of Japanese knotweed and giant hogweed.*

Alder root disease (*Phytophthora* sp.) occurs throughout the LEAP area. This is of particular concern within the River Axe pSAC/SSSI. In conjunction with English Nature and Forest Research, we are looking into the true extent of the problem on the pSAC/SSSI with a view to developing appropriate mitigating actions. Unfortunately there are no quick solutions and research into the disease is continuing across Europe. Positive findings from observations at a national scale suggest that recovery may be possible and that coppicing gives new growth a chance to develop, particularly where infection is localised to one side of the tree. Although no planting of alder should be undertaken in areas liable to flooding where the disease is present, riparian owners can encourage natural regeneration of alder by using fencing schemes for example. Further information on the disease can be obtained in the most recent Information Note dated June 2000 from the Forestry Commission. **Action 10h and Routine.**

Table 10 - Rivers, streams and fluvial processes

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
<p>a Promote and implement actions from the Devon BAP for fluvial processes by promoting measures to conserve, enhance or interpret earth science features linked to the water environment.</p> 	Agency, EDDC, EDCCS	unknown	●	●	●	●	●
<p>b Implement recommendations of exposed riverine sediments invertebrate research and development.</p> 	Agency, EN	2k p.a.	●	●	●	●	●
<p>c Promote and implement actions from the Devon BAP for otter by continuing the post-mortem programme and identify road casualty blackspots and investigate other possible causes for the slow colonisation of the LEAP area. Promote habitat creation/restoration.</p> 	Agency, DWT, EN, DCC, LPAs	3k	●	●	●	●	●
<p>d Promote and implement actions from the Devon BAP for bats by protection and restoration of wetland and riparian habitats, encouraging water quality levels which will help support populations of aquatic insects on which bats feed.</p> 	Agency, EN Devon Bat Group, DWT, Others	unknown	●	●	●	●	●
<p>e Promote and implement actions from the Devon BAP for water vole by determining the status within the LEAP area requesting information on the sightings and investigating opportunities for habitat restoration and population re-establishment if appropriate.</p> 	Agency	2k	●	●	●	●	●
<p>f Support Dorset Wildlife Trust survey of water vole on the River Axe in 2001.</p> 	Agency, DoWT	unknown		●			
<p>g Monitor spread of signal crayfish by encouraging reporting of sightings of signal and native crayfish.</p> 	Agency	unknown	●	●	●	●	●
<p>h Investigate the extent of Phytophthora within the River Axe pSAC/SSSI and develop appropriate actions in line with national understanding of the disease.</p> 	EN, Agency, Forest Research	4k	●	●	●		

**Routine Activity**

Determine status of lamprey species in the LEAP area.

Monitoring the spread of marginal and aquatic invasive plants, encouraging and facilitating their control and raising public awareness.

Controlling invasive plants on Agency-owned land.

Raising public awareness of the spread of *Phytophthora* (alder root disease), encouraging the reporting of diseased trees and providing guidance on disease control and understanding.

**Lack of Information on River Habitat** - To make more informed management decisions in the LEAP area, we need to improve our knowledge of river habitat. River Habitat Survey (RHS) is a system for assessing the physical character and quality of rivers. The RHS system is based upon a database of information gathered from over 5600 reference sites between 1994 and 1997. By recording data using a standard methodology, an assessment of habitat quality and the extent of artificial channel modification can be made.

Collecting this information on rivers is relevant not only to ourselves, but also to a wide range of other organisations and individuals. We have been able to use RHS for a number of applications including river rehabilitation assessment opportunities, investigation into sediment sources and sinks for flood defence purposes, assessment of river habitat quality for fish and the provision of evidence to support the protection of a length of river against development. RHS could also be used for the identification of issues for LEAPs.

Only 15 sites have been surveyed within this LEAP area, and many more sites (representing approximately 25% of total river length) are required before we can use RHS to its best ability. In the meantime we will use RHS on a site-specific basis, collecting information as we need it. **Action 11a.**

**Table 11 - River Habitat Survey**

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
a Complete River Habitat Surveys to cover 25% of the LEAP area. 	Agency	6k	●	●	●	●	●

**Standing open water** - There are a number of small areas of standing open water within the LEAP area ranging from ponds to ornamental lakes. Ponds occur infrequently, but provide an important habitat for a wide range of associated flora and fauna. Many ponds have been lost through infilling and neglect and loss of conservation value can also occur through the introduction of fish, waterfowl or invasive plants (see above). We must work to redress this loss/decline if we are to protect species dependent on this habitat.

Records show Great Crested Newts present within the LEAP area from 1970 onwards and we have no reason to assume that the species is no longer found. We need to improve our information generally on the distribution of amphibians within the area, especially where the rarer species are concerned. The great crested newt for example is a priority species within the UK Biodiversity plan and, whilst Devon is not a stronghold for the species, we must ensure that we work to protect any existing populations. It is likely that we will depend upon information held within county record centres to achieve this.

**Action 12a.**

*Target: Establish current status and maintain or restore to 1970s range and distribution by 2005.*

Table 12 - Standing open water

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
<p>a Promote and implement actions from the South-West BAP for standing open water by ensuring favourable management, encouraging creation of new sites and encouraging the development of county-based databases for amphibian records.</p> 	DWT, SWT, Agency, FWAG, LPAs, EN	unknown	●	●	●	●	●

**Floodplain grazing marsh** – Grazing marsh occurs along the margins of the Axe estuary, although the wildlife value has historically been reduced through agricultural improvement and infrastructure development. However, although the grassland is generally improved, there is a network of species-rich ditches across the marsh.

With the difficulties currently facing the farming community, it is becoming increasingly difficult to encourage management practices sympathetic to the needs of wildlife without appropriate funding. We will, therefore, continue to seek to influence the levels of payments and priorities for agri-environment schemes through discussions with MAFF.

**Action 13b.**

East Devon District Council have recently designated a new Local Reserve at Seaton Marshes, where a number of management proposals are being developed to maximise the wetland value of the site. We have been closely consulted and it is anticipated that we will continue to support this project. Habitat enhancements at Seaton Marshes will be of particular benefit to waders and also barn owls, which will often hunt over sympathetically managed floodplains. **Action 13a.**

*Targets: Restore 30 ha of grazing marsh which has become too dry or is intensively managed on appropriate sites (e.g. Axe estuary margins and lower reaches; Seaton Marshes) by 2005. Increase number of breeding waders, such as redshank by 1 or more pairs (c9 pairs of redshank bred at Seaton Marshes in 1998) by 2005.*

Table 13 - Floodplain grazing marsh

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
<p>a Support development of Seaton Marshes Local Nature Reserve.</p> 	EDDC, Agency,	unknown	●	●	●		
<p>b Promote and implement actions from Devon BAP for grazing marsh by encouraging sympathetic management and identify opportunities for enhancement.</p> 	Agency, RSPB, DWT, EN, EDCCS, FWAG	unknown	●	●	●	●	

**Reedbed** - This habitat occurs predominantly within the Axe estuary along the north and western shores. It is an important habitat supporting a distinctive complement of many specialised breeding bird species and, in many circumstances, large populations of amphibians. In addition to their wildlife value, reedbeds represent a sustainable method of water treatment. The opportunity for the creation of additional reedbed adjacent to the estuary is limited due to the concentration of existing habitats of wildlife value, but there may be opportunities for the creation of reedbeds, albeit on a relatively small scale, elsewhere within the area. **Action 14a.**

*Target: Create up to 1ha of additional reedbed by 2005.*

Table 14 - Reedbed

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
<p>a Promote and implement actions from Devon BAP for reedbed by encouraging appropriate management of existing reedbeds and advise on and encourage the use of reedbeds for wildlife and pollutant/effluent treatment.</p> 	Agency, LPAs, SWWL, RSPB, DWT	>1k	●	●	●	●	

**Estuaries** - The Axe estuary is a bar-built estuary containing extensive mudflats, saltmarsh and reedbeds. At low tide, islands are formed across the intertidal mudflats, isolated by a narrow channel. These mudflats support impoverished low-salinity mud invertebrate communities, which in turn attract wintering waders and wildfowl, including widgeon, lapwing and curlew. The intertidal flats are flanked with saltmarsh. Grazing occurs on saltmarsh within the upper estuary where the vegetation is typical of mid/upper saltmarsh. The lower estuary is ungrazed and has a preponderance of low/mid marsh vegetation.

Recent studies on the shoreline management<sup>11</sup> have indicated that the saltmarsh on the Axe estuary is eroding. The existing restrictions of the tramway and B3172 road on either side of the estuary will limit the opportunities for managed retreat and therefore any opportunities for saltmarsh creation. It is not however expected that sea-level rise (of up to 10 mm/year) will lead to loss of saltmarsh provided an adequate supply of sediment is maintained. **Action 15a.**

*Target: Establish current extent and quality of saltmarsh by 2001 and maintain (through adequate sediment supply). Maintain current number and range of wintering waders and waterfowl, such as widgeon, lapwing and curlew.*

Table 15 - Estuaries

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
<p>a Promote and implement actions from Devon BAP for estuaries and in addition ensure public access arrangements and management to banks etc. do not adversely affect estuary through increased disturbance.</p> 	Agency, EDCCS	<1k	●	●	●	●	●

**Sea cliffs & slopes and RIGS** - The whole coastline of the LEAP area lies within the proposed Dorset and East Devon Coast World Heritage Site, as put forward by the Government to UNESCO. As a World Heritage Site, the coast would receive international recognition as an area with globally important geological interest. The area has great scientific and educational importance, with some of the finest coastal scenery in Britain.

The Axmouth to Lyme Regis Undercliffs National Nature Reserve is part of the Sidmouth to West Bay candidate SAC, on account of the conservation importance of the vegetated sea cliffs. It includes Sidmouth to Beer Coast SSSI, Axmouth to Lyme Regis Undercliffs SSSI and a small section of the West Dorset Coast SSSI. The site comprises slumped Jurassic rocks topped by Upper Cretaceous strata, containing the most important landslip area on the British coast. This particular landslip occurred in 1839, producing a vast chasm between the remaining cliff and the part that had moved seaward. The isolation has resulted in the development of a coastal ashwood with associated plant and animal communities largely untouched by man. This is also one of the few key sites in Devon for the wood white butterfly (*Leptidea sinapis*), which is a rare species in Devon. Nightingales have also been recorded breeding here. The cliff tops are generally colonised by maritime calcareous grassland and encroaching scrub which may, in places, be developing at the expense of grassland vegetation. Peregrine falcons and occasional groups of seabirds breed on the cliffs.

The undercliffs are also the richest Lower Jurassic reptile site in Britain (and probably the world). Fossils have been collected here since the eighteenth century, including well-preserved specimens of ichthyosaurs, plesiosaurs, pterosaurs and linoosaurs.

Sites of regional earth science importance, which include river banks and cliffs are being identified to aid their protection through the Devon RIGS (Regionally Important Geological Sites) group. We will support this initiative. A similar initiative has also been undertaken in Somerset, where information is held by the Somerset Records Centre. **Action 16a.**

Table 16 - Sea cliffs & slopes

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
a Support identification of sites of regional earth science importance and encourage conservation 	Devon RIGS Group, Agency	<1k	●	●	●	●	●

**Coastal reefs & rocky seabed** - Lyme Bay contains a series of coastal reefs which are structurally complex with a variety of substrates. Several reefs occur within our seaward responsibilities in the area and support diverse communities of marine life. Included within these communities are several Mediterranean-Atlantic species, including the bryozoan *Pentapora foliacea* and the pink sea-fan *Eunicella verrucosa*, near the limit of its eastern distribution. The latter species is included within the national Biodiversity Action Plan as a species of conservation concern and is also protected under the Wildlife & Countryside Act 1981<sup>12</sup>. Little is known of the ecology of the pink sea-fan, but it is slow growing and therefore vulnerable to physical damage.

The Devon Wildlife Trust undertook a survey of these reefs during the summer of 1998<sup>13</sup>. Some of the reefs showed signs of physical damage and biological disturbance. The likelihood of further damage to these reefs is uncertain, although the high concentrations of scallops within the area will inevitably attract more fishing activity.

A working group has been established by the Devon Wildlife Trust to look into the future of these reefs. It includes members from many interested parties. We will continue to monitor progress on this project, developing actions and policies where appropriate.

## Issue 8: Recreational Use of the Area

Water-based recreational use of the LEAP area is largely restricted to the coastal section, with few sites on the river or estuary available to the public. The South West Coast Path is a national trail running along the coast; parts of the lower River Axe, Yarty, Coly and Umborne Brook also have stretches of bankside public access. The proposed National Cycle Network will pass through the southern part of the area.

Many people spend their spare time enjoying our rivers and coasts. We have a duty to promote the use of inland and coastal waters and associated land for recreational purposes, and to take account of the needs of the less able. In carrying out this duty we aim to balance the potential conflicts between conservation and recreation. We will not encourage new access routes or promote the use of particular rights of way without considering the needs of landowners or other countryside interests.

The LEAP area has considerable potential for recreation both within and adjacent to watercourses and water bodies. Many people choose to live in the West Country to take advantage of the recreational opportunities and it is likely that recreational pressure will increase further with the proposed increase in housing development for the area.

**Canoeing** - There is an informal canoeing agreement on the Axe between Whitford bridge and Axmouth bridge, however this only operates between November and February and must be booked in advance with the British Canoe Union Access Officer. Much of the river is in private ownership and considerable angling activity already occurs within the river catchment. We are not aware of any conflicts in the past and it may be that other river catchments within Devon are more suited to the establishment of access agreements. We therefore propose no further action in this river catchment at this time. Further guidance on our approach to access agreements can be found within our publication "Agreeing Access to Water for Canoeing".

We launched a phone service called Rivercall during 1998, to provide information to river users (particularly canoeists and fishermen) on the river levels. The scheme was not as successful as planned. Disappointment was expressed at the way the information on river levels was provided. Improvements are being made, with the aim of providing up-to-date information in a readily accessible and understandable format. **Action 17a.**

**Other water-based activities** - Water-based recreation within the LEAP area is largely restricted to the coastal section, with beaches along the coast offering opportunities for swimming, diving and snorkelling. The Axe Yacht Club leases part of the harbour at Axmouth and there is also a commercial fishery operating. The Axe Estuary Harbour Management Committee have been seeking new regulations to prevent water-skiing above the bridge. Lyme Regis is home to a large and active water-ski and power-boating club.

**Cycling** - The National Cycle Network being developed by Sustrans includes a proposal for a main route running from Plymouth eastwards through Devon along the south coast (Map 5). Another planned route, the South Somerset route, will branch off from the main route at Axminster to the north. We have been consulted on various stages of these routes and we will work to support this initiative and, where necessary, negotiate amendments to protect our interests. **Action 17b.**

**Walking** - As most of the river length in the area is under private ownership, without the co-operation of landowners there are few opportunities for improving access to rivers and wetlands beyond the public footpaths already in existence. The Government recently pledged its commitment to achieving greater public access on foot to open countryside. We support the general principle of increasing access for the enjoyment of the countryside; however, universal unrestricted access could generate significant problems. It is important that decisions on access must include consideration of the impact on the environment. Areas of undisturbed or quiet land can be important wildlife havens even if not covered by statutory designations. Where increased access to the countryside can be achieved in co-operation with landowners and without adversely affecting the conservation value of the water environment, there are significant benefits for people's enjoyment of the countryside.

The South West Coast Path is a national trail running along the coast, with a lengthy diversion inland at Seaton. The East Devon Way also crosses the area parallel to the coast and some way inland. There are few sites on the river or estuary available to the public. Access to rivers is restricted to existing footpaths and other rights of way. Many of these routes are difficult to use especially for the less able. We will support sensitive access initiatives that respect the interests of local people and riparian owners. **Routine.**

Table 17 - Recreational use of the area

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
a Review and develop Rivercall System. 	Agency, BCU, Fishing Associations	unknown	●	●			
b Support principle of development of South Somerset Cycle Route and appraised options. 	Sustrans, EDDC, Agency	unknown	●	●	●	●	●

**Routine Activity**

Consider proposals for wider access, particularly for the less able.

## 5. A Better Environment through Partnership

A common thread to all our work programmes is the use of our influence in areas where we may not have direct powers, or where other players have a more significant impact. We work in partnership with a range of organisations and individuals who are 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 continuing to work closely with others. We are primarily a regulatory body and do not give grants, so to achieve some of our aims we must co-operate with others such as the local authorities and the Ministry of Agriculture, Fisheries and Food to harness their financial resources and technical expertise. We can also work towards our objectives by working with voluntary groups such as the wildlife trusts and recreational associations. In some cases partnerships are already well established with other statutory bodies, especially where there is joint responsibility, such as enhancing biodiversity.

### 5.1 Community Participation

We involve the local community by the establishment of a Steering Group to represent the interests of the commercial sector, local authorities and environmental groups. The Steering Group comment upon the Consultation Draft and Action Plan prior to public release. They will monitor the implementation of the Action Plan and provide us with specific advice on the importance of issues within the LEAP area. They act as a communication link between ourselves and the local community and help to promote and develop initiatives of benefit to the environment of the Axe and Lim LEAP area. The Steering Group members are:

<b>Name</b>	<b>Representing</b>
Mr P R Burrough	Agriculture
Mr J Boulton	Axe Fly Fishers
Mr B W F Terry	Axe Fly Fishers
Mr D Campbell	Axe Vale and District Conservation Society
Commander C B Tuke	Axe Vale Rivers Association
Ms D Eckhart	Blackdown Hills Area of Outstanding Natural Beauty
Mr N Butler	East Devon Heritage Coast Service
Mr C Pulteney	English Nature
Mr I Dunford	Local Industry (St Ivel)
Mr K Whetlor	Lyme Regis Environmental Group
Mrs S Poupard	Lyme Regis Town Council
Mr T C Frost	National Farmers Union
Mr B Newbury	National Farmers Union
Mr C G Pole-Carew	Riparian Owners
Mr D Minchin	Riparian Owners
Mr M Williams	South West Water Ltd
Mr J Williams	Taunton Fly Fishing Association

### 5.2 Development Plans

We can control some of the factors influencing the quality of the environment, but we have limited control over the way that land is developed. This is the responsibility of local planning authorities.

Local authorities prepare statutory development plans. The policies in these plans will guide the way that land is developed in the future. We provide advice and guidance to local planning authorities and work with them to develop and adopt policies which minimise the impact of any development upon the environment. We will reinforce these policies, where we can, when commenting on planning matters or in making our own decisions. LEAPs are one way we aim to influence the content of Local Authority plans.

### 5.3 Non-statutory Plans

We work with others to develop partnerships and collaborative projects. The actions are identified in the following non-statutory plans. These include:

- Devon Biodiversity and Earth Science Action Plan

- Devon's Local Agenda 21 Network Issues Report
- Lyme Bay and South Devon Shoreline Management Plan (in preparation)
- Heritage Coast Management Plan
- English Nature Natural Area Plans
- Blackdown Hills AONB
- East Devon AONB

## 5.4 Local Agenda 21

'Agenda 21' is the global action plan endorsed at the United Nations Conference on Development and the Environment in 1992. It has been designed to achieve sustainable development within all levels of our society - from national government to individuals in their homes and workplaces.

Local authorities are helping their local communities in developing strategies and action plans for sustainable development. Devon, Dorset and Somerset County Councils have all set up Local Agenda 21 (LA21) networks within their respective counties to assist in this.

In East Devon the Agenda 21 process is led by East Devon District Council, who intend to complete a LA21 strategy for their area within the next few months. In the remainder of the LEAP area, South Somerset District Council and Taunton Deane Borough Council have both established LA21 strategies.

We are committed to encouraging more sustainable lifestyles for all, through our work and in partnership with others. This is captured in our vision which is "a better environment in England and Wales for present and future generations." We hope to liaise with local authorities and other groups or individuals to progress sustainable development in the country. Locally, we are already involved with a number of groups and projects across the region.

## 5.5 Integrated Coastal Zone Management

Devon and Cornwall have one of Europe's finest natural and historic coastlines. Over a number of years numerous bodies in this area have formed partnerships to develop coastal initiatives, including Estuary Management Plans, Heritage Coasts, Shoreline Management Plans and Marine Action Plans.

**The Atlantic Living Coastlines Project** - The aim of this project was to draw together the numerous plans for coastal areas of Devon and Cornwall to produce a strategy for Integrated Coastal Zone Management. This project was funded from the EU TERRA fund with funding matched by existing expenditure on coastal zone management in the area (including the Agency's LEAPs for Devon and Cornwall). Currently there are no specific resources for the implementation of the strategy.

**Shoreline Management Plan (SMP)** - This document sets out a strategy for coastal defence for a specified length of coast, taking account of natural coastal processes, human and other environmental influences. SMPs are part of an initiative on the future planning of our coastline, with backing from MAFF, the Association of District Councils, English Nature and ourselves.

In partnership with local authorities, county councils and English Nature, we have prepared the Lyme Bay and South Devon SMP which was adopted in December 1998. This SMP covers the coastal cell from Portland Bill to Rame Head and sets out a strategy for coastal defence. This LEAP considers conservation and recreation issues and the preservation and enhancement of the landscape interest of the coastline in relation to sea defence and coastal protection policies.

## 5.6 The Environment Agency and Public Information

We are committed to being an open organisation; we will provide information about our decisions and actions and ensure consultation for our customers on plans and reports. Our Customer Charter sets out how we aim to achieve this commitment. We must maintain a set of public registers which hold information on the activities we regulate and the monitoring we carry out. In addition to the information we place on registers, we make available most other environmental information that we hold.

We have produced a guide to information available to the public, which sets out what information is accessible and how to obtain it. Information is usually provided free of charge, but for large and complex requests we may charge for staff time and materials. Confidential information, incomplete or draft reports, and information where disclosure may lead to environmental damage are generally not available. Some environmental details and information about our public registers are available on the internet on <http://www.environment-agency.gov.uk>.

## 6. Duties, Powers and Interests of the Environment Agency

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

Agency Duty	The Agency has powers to:	The Agency has an interest (but no direct powers) in:	Partnership
<p><b>Water Resources</b></p> <p>The Agency has a duty to conserve, redistribute, augment and secure the proper use of water resources.</p>	<ul style="list-style-type: none"> <li>● Grant or vary water abstraction and impoundment licences on application with appropriate conditions imposed to safeguard the needs of the environment whilst allowing reasonable and justified use of available and sustainable water resources - with the aim of achieving an equitable balance between competing demands.</li> <li>● Revoke or vary existing licences to reinstate flows or levels to surface waters or groundwater which have become depleted as a result of abstraction. Compensation may be payable if such powers are used.</li> <li>● Secure the proper use of water resources through our role in water resources planning, and the assessment of reasonable need for abstractions and the promotion of more efficient use of water resources.</li> <li>● Monitor and enforce abstraction and impoundment licences.</li> <li>● Issue conservation notices to direct appropriate practices with regard to water resources issues associated with exempt dewatering activities.</li> </ul>	<ul style="list-style-type: none"> <li>● The more efficient use of water by water companies, developers, industry, agriculture and the public and the introduction of water-efficiency measures and suitable design and layout of the infrastructure.</li> <li>● Protecting the water environment from any adverse impact due to proposed major developments.</li> </ul>	<ul style="list-style-type: none"> <li>● The Agency uses its position as a statutory consultee to the planning authorities to secure conditions and agreements that protect the water environment and that encourage water conservation measures.</li> <li>● The Agency also seeks to influence planning decisions for new development by ensuring that planning authorities allow for any lead-time required for resource development.</li> <li>● The Agency is committed to water-demand management and will work closely with water companies and developers, local authorities and relevant organisations to promote the efficient use of water.</li> <li>● The Agency acknowledges that new resources may be needed in the future and supports a twin-track approach of planning for water resource development alongside the promotion of demand-management measures</li> </ul>

Agency Duty	The Agency has powers to:	The Agency has an interest (but no direct powers) in:	Partnership
<p><b>Flood Defence</b></p> <p>The Agency has a duty to exercise general supervision over all matters relating to flood defence throughout each LEAP area.</p>	<ul style="list-style-type: none"> <li>● Control, through Land Drainage consents, of development within 8 m of main river (Water Resources Act 1991, Section 109) or construction of a structure that would affect the flow of an ordinary watercourse (Land Drainage Act, 1991 Section 23).</li> <li>● Produce flood risk maps for all main rivers under S105 of Water Resources Act 1991.</li> <li>● Undertake works to main rivers using permissive powers.</li> <li>● Issue flood warnings relating to main river to the public, local authorities and the police.</li> <li>● Consent mineral working within 16 m of main rivers.</li> </ul>	<ul style="list-style-type: none"> <li>● Granting of planning permission throughout a LEAP area but especially floodplains where development can significantly increase flood risk. This permission is granted by local planning authorities.</li> <li>● Installation of surface water source control measures e.g. flood attenuation structures.</li> <li>● Supervising the maintenance of ordinary watercourses which is a local authority remit, but may impact on main rivers.</li> <li>● Installation of buffer zones which reduce flood risk and have significant environmental benefits.</li> <li>● Urban and rural land use and measures that can reduce flood risk or the need for watercourse maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>● As a statutory consultee on planning applications within main river floodplains the Agency offers advice based on knowledge of flood risk. It also advises on the environmental impacts of proposed floodplain development.</li> <li>● The Agency will encourage best practice, including source control measures and common standards, among local authorities and riparian owners to protect and enhance the environment. The Agency works with the civil authorities to prepare flood warning dissemination plans and supports their endeavours to protect communities at risk.</li> </ul>
<p><b>Water Quality</b></p> <p>The Agency has a duty to monitor, protect, manage and, where possible, enhance the quality of all controlled waters including rivers, groundwaters, lakes, canals, estuaries and coastal waters through the prevention and control of pollution.</p>	<ul style="list-style-type: none"> <li>● Issue discharge consents to control pollution loads in controlled waters.</li> <li>● Regulate discharges to controlled waters in respect of water quality through the issue and enforcement of discharge consents.</li> <li>● Issue 'works notices' where action is required to reduce the risk of pollution.</li> <li>● Prosecute polluters and recover the costs of clean-up operations.</li> <li>● Serve prohibition notices (with or without conditions) on highway authorities to require treatment and pollution measures for highway runoff.</li> </ul>	<ul style="list-style-type: none"> <li>● The greater use of source control measures to reduce pollution by surface water runoff.</li> <li>● Prevention and education campaigns to reduce pollution incidents.</li> <li>● The provision of highway runoff control measures which is a highway authority remit.</li> </ul>	<ul style="list-style-type: none"> <li>● The Agency will liaise with local authorities, developers, the Highways Agency, industry and agriculture to promote pollution prevention and the adoption of source control measures. As a statutory consultee on planning applications, the Agency will advise local planning authorities on the water quality impact of proposed developments.</li> </ul>

Agency Duty	The Agency has powers to:	The Agency has an Interest (but no direct powers) in:	Partnership
<p><b>Air Quality</b></p> <p>The Agency has a duty to implement Part 1 of the Environment Protection Act 1990.</p>	<ul style="list-style-type: none"> <li>● Regulate the largest technically complex and potentially most polluting prescribed industrial processes such as refineries, chemical works and power stations including enforcement of, and guidance on, BATNEEC and BPEO.</li> <li>● Have regard to the government's National Air Quality Strategy when setting standards for the releases to air from industrial processes.</li> </ul>	<ul style="list-style-type: none"> <li>● The vast number of smaller industrial processes which are controlled by local authorities.</li> <li>● Control over vehicular emissions and transport planning.</li> </ul>	<ul style="list-style-type: none"> <li>● The Agency provides data on IPC processes and advice on planning applications to local authorities. The Agency is willing to offer its technical experience to local authorities on the control of air pollution. The Agency wishes to liaise with local authorities in the production of their Air Quality Management Plans. The Agency will advise and contribute to the government's National Air Quality Strategy.</li> </ul>
<p><b>Radioactive Substances</b></p> <p>The Agency has a duty under the Radioactive Substances Act 1993 to regulate the use of radioactive materials and the disposal of radioactive waste.</p>	<ul style="list-style-type: none"> <li>● To issue certificates to users of radioactive materials and disposers of radioactive waste, with an overall objective of protecting members of the public.</li> </ul>	<ul style="list-style-type: none"> <li>● The health effects of radiation.</li> </ul>	<ul style="list-style-type: none"> <li>● The Agency will work with users of the radioactive materials to ensure that radioactive wastes are not unnecessarily created, and that they are safely and appropriately disposed of. The Agency will work with MAFF to ensure that the disposal of radioactive waste creates no unacceptable effects on the food chain.</li> <li>● The Agency will work with the Nuclear Installations Inspectorate to ensure adequate protection of workers and the public at nuclear sites.</li> <li>● The Agency will work with the HSE on worker protection issues at non-nuclear sites.</li> </ul>
<p><b>Waste Management</b></p> <p>The Agency has a duty to regulate the management of waste, including the treatment, storage, transport and disposal of controlled waste, to prevent pollution of the environment, harm to public health or detriment to local amenities.</p>	<ul style="list-style-type: none"> <li>● Vary waste management licence conditions.</li> <li>● Suspend and revoke licences.</li> <li>● Investigate and prosecute illegal waste management operations.</li> </ul>	<ul style="list-style-type: none"> <li>● The siting and granting of planning permission for waste management facilities. This is conducted by the waste industry and local planning authorities. The Agency, as a statutory consultee on planning applications, can advise on such matters.</li> <li>● Serve notices to require improvements to waste facilities or for the removal of waste.</li> </ul>	<ul style="list-style-type: none"> <li>● The Agency will work with waste producers, the waste management industry and local authorities to reduce the amount of waste produced, increase re-use and recycling and improve standards of disposal.</li> </ul>

Agency Duty	The Agency has powers to:	The Agency has an interest (but no direct powers) in:	Partnership
<p><b>Contaminated Land</b></p> <p>The Agency has a duty to develop an integrated approach to the prevention and control of land contamination, ensuring that remediation is proportionate to risks and cost-effective in terms of the economy and environment.</p>	<ul style="list-style-type: none"> <li>● Regulate the remediation of contaminated land designated as special sites.</li> <li>● Prevent future land contamination by means of its IPC, Water Quality and other statutory powers.</li> <li>● Report on the state of contaminated land.</li> </ul>	<ul style="list-style-type: none"> <li>● Securing with others, including local authorities, landowners and developers, the safe remediation of contaminated land.</li> </ul>	<ul style="list-style-type: none"> <li>● The Agency supports land remediation and will promote this with developers and local authorities and other stakeholders.</li> </ul>
<p><b>Conservation</b></p> <p>The Agency will further conservation, wherever possible, when carrying out water management functions; have regard to conservation when carrying out pollution control functions; and promote the conservation of flora and fauna which are dependent on an aquatic environment.</p>	<ul style="list-style-type: none"> <li>● The Agency has no direct conservation powers but uses its powers with regard to water management and pollution control to exploit opportunities for furthering and promoting conservation.</li> </ul>	<ul style="list-style-type: none"> <li>● The conservation impacts of new development. These are controlled by local planning authorities.</li> <li>● Protection of specific sites or species, which is a function of English Nature. The Agency does, however, provide advice to local authorities and developers to protect the integrity of such sites or species.</li> <li>● Implementation of the UK Biodiversity Plan for which it is the contact point for 35 species and one habitat.</li> </ul>	<ul style="list-style-type: none"> <li>● The Agency supports action to sustain or improve natural and man-made assets so that they are made available for the benefit of present and future generations. Many development schemes have significant implications for conservation. The Agency will work with developers, local authorities, conservation bodies and landowners to conserve and enhance biodiversity.</li> </ul>
<p><b>Landscape</b></p> <p>The Agency will further landscape conservation and enhancement when carrying out water management functions; have regard to the landscape when carrying out pollution control functions; and promote the conservation and enhancement of the natural beauty of rivers and associated land.</p>	<ul style="list-style-type: none"> <li>● The Agency must further the conservation and enhancement of natural beauty when exercising its water management powers and have regard to the landscape in exercising its pollution control powers.</li> </ul>	<ul style="list-style-type: none"> <li>● The landscape impact of new development, particularly within river corridors. This is controlled by local planning authorities.</li> </ul>	<ul style="list-style-type: none"> <li>● The Agency produces River Landscape Assessments and Design Guidelines which it uses when working with local authorities and developers to conserve and enhance diverse river landscapes.</li> </ul>
<p><b>Archaeology</b></p> <p>The Agency has a duty to consider the impact of all of its regulatory, operational and advising activities upon archaeology and heritage, and implement mitigation and enhancement measures where appropriate.</p>	<ul style="list-style-type: none"> <li>● The Agency must promote its archaeological objectives through the exercise of its water management and pollution control powers and duties.</li> </ul>	<ul style="list-style-type: none"> <li>● Direct protection or management of sites of archaeological or heritage interest. This is carried out by local planning authorities, County Archaeologists and English Heritage.</li> </ul>	<ul style="list-style-type: none"> <li>● The Agency will liaise with those organisations which have direct control over archaeological and heritage issues to assist in the conservation and enhancement of these interests.</li> </ul>

Agency Duty	The Agency has powers to:	The Agency has an interest (but no direct powers) in:	Partnership
<p><b>Fisheries</b></p> <p>The Agency has a duty to maintain, improve and develop salmon, trout, freshwater and eel fisheries.</p>	<ul style="list-style-type: none"> <li>• Regulate fisheries by a system of licensing.</li> <li>• Make and enforce fisheries byelaws to prevent illegal fishing.</li> <li>• Promote the free passage of fish and consent fish passes.</li> <li>• Monitor fisheries and enforce measures to prevent fish entrainment in abstractions.</li> <li>• Promote its fisheries duty by means of land drainage consents, water abstraction applications and discharge applications.</li> </ul>	<ul style="list-style-type: none"> <li>• The determination of planning applications which could affect fisheries.</li> </ul>	<ul style="list-style-type: none"> <li>• Many development schemes have significant implications for fisheries. The Agency will work with anglers, riparian owners, developers and local authorities to protect fisheries.</li> </ul>
<p><b>Recreation</b></p> <p>The Agency has a duty to promote rivers and water space for recreational use.</p>	<ul style="list-style-type: none"> <li>• The Agency contributes towards its recreation duty through the exercise of its statutory powers and duties in water management.</li> </ul>	<ul style="list-style-type: none"> <li>• Promotion of water sports. This is carried out by the Sports Council and other sports bodies.</li> </ul>	<ul style="list-style-type: none"> <li>• The Agency will work with the Countryside Commission, the Sports Council, British Waterways and other recreational and amenity organisations to optimise recreational use of the water environment.</li> </ul>

## Appendices

### Appendix 1: Actions from the Axe & Lim Consultation Draft

The following is a list of actions which were proposed in the Axe and Lim LEAP Consultation Draft and their status within this Action Plan, together with actions which have been developed subsequently.

Former Consultation Draft Action	Number in this Action Plan
1a Consider first time-sewerage at the following; Clapton, Combyne, Chilson Common and Thorncombe.	Amended action 1a
1b Seek improvements to the following discharges in AMP3: Seaton, Beer Head, Tatworth and Dalwood.	Action 1b
1c Carry out further work to determine sources of bacterial contamination at Lyme Regis (Church) and Lyme Regis (Cobb) beaches.	Action 1c
1d Determine impact of Wilmington Trout farm on the Umbourne brook.	Action 1d
1e Review results of monitoring to see if exceedence of the EQS for lead recurs in the River Axe at Slymlakes	Site no longer exceeding EQS - action removed
2a Review results of River Otter atrazine study to assess implications for the Axe/Lim Catchment.	Action 2a
2b Seek external funding for a project to reduce diffuse pollution in the catchment.	Action 2b
2c Support River Yarty Headwaters Project.	Action 2c
3a Investigate potential sources of nutrient inputs to the SSSI using plant surveys and nutrient data.	Action 3a
4a Identify contaminated land sites in the catchment.	This action will be progressed by local authorities
4b Provide information (S105 Level B Surveys) to planning authorities to prevent inappropriate development in the floodplain.	'Level B' surveys are not being undertaken in this LEAP area
4c Complete review of flood warning standards of service and where necessary improve flood warning at some locations.	Action 4a
5a Low flows in the Umborne Brook – complete calibration work to enable precise gauging of abstraction.	Action 5a
5b Seek to remedy issue of deprived reach by agreement at Wilmington Trout Farm.	Action 5b
6a Continue salmon stocking programme.	Action 6a
6b Develop Salmon Action Plan for the River Axe in line with national guidance.	We are unable to progress this action due to funding constraints

Former Consultation Draft Action	Number in this Action Plan
6c Continue programme of habitat improvements including gravel rehabilitation.	Action 6b
6d Install fish passes, according to regional priority, on Lexhayne Weir and Wilmington Weir.	Action 6c
6e Seek to have existing 'Irish Bridges' that restrict fish passage removed or replaced.	Action 6d
6f Include the River Axe in the current Agency/Wild Trout Society investigation into the decline in brown trout in Devon rivers	Action 6e
6g Investigate status of roach and dace stocks, particularly of larger fish, including surveys of middle and lower reaches to assess current coarse fish populations.	Action 6f
6h Implement findings of joint Agency/MAFF research on fish-eating birds where appropriate.	Amended action 6g
6i Pursue changes in law to allow increased control of in-river works where damage to the fishery is likely to result.	Action 6h
7a Review air quality in the area, in line with National Air Quality Strategy and develop appropriate actions.	This action will be progressed by Local Authorities
8a Lack of archaeological information in a useable format – discuss options for a rapid archaeological assessment of the whole catchment with potential partners.	Action 4b
8b Review Defence of Britain Project to identify any actions for the Agency regarding pill-boxes.	Action 4c
8c Concern over loss of amenity at Middle Mill Weir – examine feasibility of reinstating leat at Middle Mill Weir, taking account of environmental and flood defence considerations.	Amended action 4d
9a Review all existing permissions for the cSACs in the catchment to identify which are likely to have a significant effect on the sites.	Action 7a
9b Conduct assessments on identified permissions to establish any adverse effects.	Action 7b
9c Establish criteria for designation of rivers and streams as County Wildlife Sites and examine potential for creating demonstration sites for best working practice.	Action 7c
10a Promote and implement actions from the Devon BAP for wet woodland by assisting with assessment of extent of resource, seeking potential new sites and promoting use as buffer strips.	Action 8a
10b Identify areas of river valleys where tree planting can be encouraged without adversely affecting flood risks.	Action 8b
10c Create new areas of wet woodland through planting and appropriate management.	Action 8c
11a Promote and implement actions from the Devon BAP for Rhôs pasture by encouraging sympathetic management and/or restoration of sites. Also discourage inappropriate creation of lakes/ponds within Rhôs pasture.	Action 9a
11b Promote and implement actions from the Devon BAP for curlew & marsh fritillary by promoting sympathetic management and restoration of breeding sites.	Action 9c
11c Promote and implement actions from the Devon BAP for barn owl by promoting appropriate management of riparian feeding habitats and providing nest boxes to encourage recolonisation.	Action 9d
11d Support measures from the National Fen, Carr, Marsh, Swamp & Reedbed Habitat Statement, and enter 80% of spring-line mire catchment resource into protective management by 2005.	Amended action 9e

Former Consultation Draft Action	Number in this Action Plan
12a Promote and implement actions from the Devon BAP for rivers and streams by providing guidance on best practice for riverbank management, promoting the creation of riparian buffer strips through advice and provision of fencing.	Action 2d & 2e
12b Promote and implement actions from the Devon BAP for fluvial processes by promoting measures to conserve, enhance or interpret earth science features linked to the water environment.	Action 10a
12c Implement recommendations of exposed riverine sediments invertebrate research and development.	Action 10b
12d Promote and implement actions from the Devon BAP for otter by continuing the post-mortem programme and identify road casualty blackspots and investigate other possible causes for the slow colonisation of the catchment. Promote habitat creation/restoration.	Action 10c
12e Promote and implement actions from the Devon BAP for water vole by determining the status within the catchment and investigating opportunities for habitat restoration and population re-establishment if appropriate.	Action 10e
12f Promote and implement actions from the Devon BAP for freshwater white-clawed crayfish by surveying historical sites to confirm presence and initiate appropriate habitat management, and develop and implement actions to protect populations dependent upon survey.	Amended action 10g
13a Promote and implement actions from the South-West BAP for standing open water by ensuring favourable management, encouraging creation of new sites and encouraging the development of a county-wide database for amphibians.	Amended Action 12a
14a Support development of Seaton Marshes Local Nature Reserve.	Action 13a
14b Promote and implement actions from Devon BAP for grazing marsh by encouraging sympathetic management and identify opportunities for enhancement.	Action 13b
15a Promote and implement actions from Devon BAP for reedbed by encouraging appropriate management of existing reedbeds and advise on and encourage the use of reedbeds for wildlife and pollutant/effluent treatment.	Action 14a
16a Promote and implement actions from Devon BAP for estuaries and in addition ensure public access arrangements and management to banks etc. do not adversely affect estuary through increased disturbance.	Action 15a
17a Support identification of sites of regional earth science importance and encourage conservation.	Action 16a
18a Review and develop Rivercall System	Action 17a
18b Support principle of development of South Devon Cycle Route and appraise options.	Action 17b
19a Complete River Habitat Surveys to cover 25% of the catchment.	Action 11a

**New Action**

- 2d Encourage riparian owners to undertake management of bankside trees and provide suitable conditions for development of more extensive marginal vegetation.
- 2e Where appropriate, promote bankside fencing schemes to limit bank erosion and reduce sediment input to the river.
- 5c Implement CAMS for the LEAP area.
- 9b Promote and implement actions from Dorset BAP for fens.
- 10d Promote and implement actions from the Devon BAP for bats by protection and restoration of wetland and riparian habitats, encouraging water quality levels which will help support populations of aquatic insects on which bats feed.
- 10f Support Dorset Wildlife Trust survey of water vole on the River Axe in 2001.
- 10h Investigate the extent of *Phytophthora* within the River Axe pSAC/SSSI and develop appropriate actions in line with national understanding of the disease.

## Appendix 2: List of Organisations which responded to the Consultation Draft

During the consultation process for the Axe and Lim LEAP we received representations from a number of organisations. The following is a list of both National and Local organisations which responded.

**National Organisations**

Atlantic Salmon Trust  
 British Canoe Union  
 British Hydropower Association  
 Clean Rivers Trust  
 English Heritage  
 English Nature  
 Farming and Rural Conservation Agency  
 Highways Agency  
 National Farmers Union  
 The Hawk and Owl Trust  
 The Inland Waterways Association  
 Westcountry Tourist Board

**Regional and Local Organisations**

Axminster Town Council  
 Devon County Council  
 Devon Farming and Wildlife Advisory Group  
 Devon Sea Fisheries  
 Dorset Wildlife Trust  
 East Devon District Council  
 The Offwell Woodland and Wildlife Trust  
 West Dorset District Council

Responses were also received from a number of individuals with an interest in the area. A copy of the Summary of Public Consultation for the Axe and Lim LEAP is available on request. If you would like a copy please contact the LEAPs Team at the address at the front of this plan.

### Appendix 3: Compliance with EC Directives

One way in which we manage water quality is by applying standards set in EC Directives. Failures to comply with these standards are discussed in Issues 1 and 2.

**EC Bathing Water Directive<sup>5</sup>** - The EC Directive concerning the quality of bathing water seeks to protect public health and the amenity value of popular bathing waters by reducing pollution. The Directive contains standards for nineteen microbiological, physical and chemical parameters to assess bathing water quality. Compliance is assessed mainly by testing against standards for faecal indicator bacteria.

We are responsible for monitoring the quality of identified, bathing waters and providing the results to the DETR who decide whether the standards in the Directive have been met. Where identified bathing waters fail to meet the Directive standards, we are responsible for identifying sources of pollution that are causing failures, and making sure that improvements are made. Our priority is to ensure compliance with the mandatory standards of the EC Directive. We will also seek compliance with guideline standards where this is achievable, taking into consideration costs and benefits.

There are four identified EC Bathing Waters in the LEAP area as shown in the following table with their history of compliance with, or failure to meet, the mandatory standards of the Directive:

EC Bathing Water	1994	1995	1996	1997	1998	1999
Lyme Regis (Cobb)	Beach Closed*	Pass	Pass	Pass	Pass	Pass
Lyme Regis (Church)	Beach Closed*	Pass	Pass	Fail	Pass	Pass
Seaton	Pass	Pass	Pass	Pass	Pass	Fail
Beer	Fail	Pass	Pass	Pass	Pass	Fail

\* This beach was closed during the construction of the SWWL Clean Sweep scheme for Lyme Regis.

**EC Dangerous Substances Directive<sup>6</sup>** - This EC Directive on pollution caused by certain substances discharged in the aquatic environment of the community protects the water environment by controlling discharges that contain harmful substances to rivers, estuaries and coastal waters.

The Directive describes two lists of compounds. List 1 contains substances regarded as particularly dangerous because they are toxic, persist in the environment and bio-accumulate; discharges containing List 1 substances must be controlled by EQSs issued through Daughter Directives. List 2 contains substances which are considered to be less dangerous but which can still have a harmful effect on the water environment. Discharges of List 2 substances are controlled by EQSs set by the individual Member States.

We are responsible for authorising, limiting and monitoring dangerous substances in discharges. We are also responsible for monitoring the quality of waters which receive discharges containing dangerous substances and reporting the results to the DETR who decide whether the standards in the Directive have been met. Where the requirements of this Directive are not met, we are responsible for identifying sources of pollution and making sure that improvements are made.

Currently, the receiving waters downstream of three discharges in the Axe and Lim LEAP area are monitored under the Dangerous Substances Directive. The discharges are shown in the table below along with the receiving water compliance, for failure, with the Directive 1996-1998.

Table F - EC Dangerous Substances Directive sites within the LEAP area

Discharge	Monitoring site(s)	List I substances Monitored	List II substances monitored	Compliance 1996-1998
Axminster (Kilmington) STW	River Axe at Slymlakes	Mercury, Cadmium, HCH*	Arsenic, Copper, Chromium, Lead, Zinc, Nickel	Compliant 1996, 1997, Fail 1998. (See Issue 1)
Seaton (Main) STW	River Axe downstream of STW/off yacht club		Copper, Chromium, Lead, Zinc, Nickel	Compliant 1996-1998.
Axminster Town Railway Station (storm sewage overflow)	River Axe at Bow Bridge	Mercury, Cadmium	Arsenic, Lead, Zinc, Nickel	Compliant 1996-1998.

\* HCH = Hexachlorocyclohexane

In addition, all List I substances are monitored at the National Network site at Whitford Bridge. This site has complied with Environmental Quality Standards in the period 1996-1998.

**EC Freshwater Fish Directive<sup>14</sup>** – The EC Directive on the quality of waters needing protection or improvement in order to support fish life ensures that water quality in designated stretches of water is suitable for supporting certain types of fish.

The Directive contains two sets of quality standards. One set of standards protects cyprinid or coarse fish populations for example roach and chub. The other set of standards, that are stricter, protects salmonid or game fish populations for example, salmon and trout.

We are responsible for monitoring the quality of identified fisheries and reporting the results to the DETR who decide whether the standards in the Directive have been met. Where the requirements of this Directive are not met, we are responsible for identifying sources of pollution and making sure that improvements are made.

There are six stretches designated as freshwater fisheries in the Axe & Lim LEAP area; these are shown in the table below along with their compliance with the Directive 1995-1999.

River	Stretch	Type of fishery	Compliance 1995-1999
Lim	Source - Mean High Water	Salmonid	Compliant
Axe	Seaborough - Broom	Salmonid	Compliant
Axe	Broom - Normal Tidal Limit	Salmonid	Compliant
Coly	Woodbridge - Normal Tidal Limit	Salmonid	Compliant
Yarty	Newhaven Bridge - Confluence With Axe	Salmonid	Compliant
Corry	Rose Farm - Confluence With Yarty	Salmonid	Compliant

**EC Groundwater Directive<sup>15</sup>** - Groundwater Regulations 1999. These regulations complete the implementation of the 1980 EC Groundwater Directive in England and Wales. This Directive aims to protect the quality of groundwater by:

- Preventing the discharge into groundwater of substances in List I;
- Limiting the discharge of substances in List II so as to prevent pollution.

List I substances are those that are most harmful to humans or the environment, and include sheep-dip, pesticides, solvents, hydrocarbons, mercury, cadmium and cyanide. List II substances are less dangerous, but could be harmful to groundwater if disposed of in large amounts; these substances include some heavy metals, ammonia and phosphorus.

Anyone disposing of List I or List II substances to land (unless covered by certain exclusions) must have written authorisation from us before doing so. Conditions attached to the authorisation will minimise the environmental risks. If the risk to groundwater is too great, the application will be refused. An authorisation is not required where the activity is already covered by a waste management licence, discharge consent or IPC authorisation.

Other activities that do not involve disposal but may nevertheless cause a discharge of a listed substance to ground must

comply with approved codes of practice, and we may, if necessary, issue a notice to further control or prohibit the activity. Such activities might include the storage and handling (as opposed to disposal) of hydrocarbons, solvents and other chemicals, animal carcass burial, use of sheep-dips and other pesticides and sewerage systems.

**EC Urban Waste Water Treatment Directive**<sup>7</sup> - The EC Directive concerning urban waste water treatment specifies minimum standards for sewage treatment and sewage collection systems.

The Directive specifies that secondary treatment must be provided for all discharges serving population equivalents greater than 2,000 to inland waters and estuaries, and greater than 10,000 to coastal waters. Discharges below these population equivalents receive appropriate treatment as defined in the AMP2 guidance note. We are responsible for making sure that discharges receive the level of treatment specified in the Directive.

This Directive also requires higher standards of treatment for discharges to sensitive areas (see Issue 3 – Potential for Eutrophication).

Three discharges in the Axe and Lim LEAP area require improvements under the UWWTD; these are Beer Head outfall, Tatworth STW and Dalwood STW.

## Appendix 4: Species of Importance for Biodiversity

The following table lists the key species associated with the aquatic environment, which are present in the Axe and Lim LEAP Area, indicating the relevant Biodiversity Action Plan and the level of our responsibility in delivering actions.

Table G - Key Species within the LEAP area linked to their relevant BAP

SPECIES	Associated habitat	National BAP - Priority Species (with existing or proposed Action Plan)	National BAP - Species of conservation concern	Regional BAP	County BAP	Agency responsibility
Otter*	Rivers, streams & wetlands	●			●	Contact / Lead Partner
Water vole	Rivers, streams & wetlands	●		●	●	Contact
Pipistrelle bat*	Woodland, wetland & hedgerows	●		●		Delivering action
Sand martin	Rivers and earth/sand cliffs		●			Biodiversity commitment
Kingfisher	Rivers & streams		●			Biodiversity commitment
Curlew	Rhôs pasture, spring-line mire & moorland		●		●	Biodiversity commitment
Reed bunting	Wet grassland & reedbed	●				Delivering action
Barn owl	Rhôs pasture, spring-line mire, moorland & rough grassland				●	Delivering action
Lapwing	Grazing marsh		●			Biodiversity commitment
Snipe	Rhôs pasture, spring-line mire & moorland		●			Biodiversity commitment
Atlantic salmon*	Rivers & streams		●		●	Delivering action
Bullhead	Rivers & streams		●			Biodiversity commitment
River lamprey	Rivers & streams		●			Biodiversity commitment
Brook lamprey	Rivers & streams		●			Biodiversity commitment
Sea lamprey	Rivers & streams		●			Biodiversity commitment
Marsh fritillary	Rhôs pasture & spring-line mire	●		●	●	Delivering action
Medicinal leech *	Rivers, streams & ditches	●				Biodiversity commitment
Invertebrates of Exposed Riverine Sediments	Riverine sediments	Specific species action plans developed under National BAP	● (River Shingle Beetle)			Biodiversity commitment
Short-leaved water - starwort	Rivers, streams & ditches					Biodiversity commitment, no action plan proposed

\* Specifically protected under the Habitats Directive

## Glossary

**Abstraction** – Removal of water from surface or groundwater sources.

**Asset Management Plan (AMP)** – Asset Management Plans are produced by the Water Companies for the Office of Water Services (OFWAT). They set out the water industry investment programme for a set number of years.

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

**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 and between species and ecosystems. (Article II of the Biodiversity Convention.)

**Catchment** – The total area from which a single river collects surface runoff.

**Coarse fish** – This is a layman's term of cyprinid fish and other commonly associated species such as pike, perch and eels of angling significance. The term does not normally refer to minor species such as bullhead, stone loach, minnow and stickleback.

**Confluence** – The point at which two rivers meet.

**Country Stewardship Scheme** – A grant scheme piloted by the Countryside Commission to enhance and conserve important English landscapes, wildlife habitats and history; run by MAFF from April 1996.

**Environmental Quality Standard (EQS)** – 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.

**Environmentally Sensitive Area (ESA)** – An area designated by MAFF where grant aid is available to support traditional farming methods.

**Eutrophic** – Water enriched with nutrients which result in high plant (including algal) growth. Usually used when referring to enrichment from man-made sources such as fertilisers leaching into soil.

**Groundwater** – Water contained in the void spaces in pervious rocks and also within the soil.

**Hydrology** – The study of water and its dynamics.

**Macroinvertebrate** – A large invertebrate, e.g. jellyfish, snail, fly.

**OFWAT** – The Office of Water Services, the water industry regulator.

**Outfall** – The point where a river or pipe discharges.

**Riparian** – Relating to or situated on the bank of a river or stream.

**Riparian Owner** – Owner of a riverbank and/or land adjacent to a river. Normally owns riverbed and rights to mid-line of channel.

**River Quality Objective (RQO)** – The level of water quality that a river should achieve in order to be suitable for its agreed uses.

**Runoff** – Rainwater which does not soak into the ground, but which runs over the surface in a downhill direction.

**Salmonid** – Game fish of the salmon family, e.g. salmon, trout and sea trout.

**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 105 Survey** – Section 105 of the Water Resources Act 1991 allows for Standards of Service Assets and Flood Risk Surveys.

**Sensitive Area** – An area whose waters receive discharges from population equivalents of greater than 10,000 and are or may become eutrophic.

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

**Sewerage** – A system of underground pipes designed to carry sewage to sewage treatment works.

**Siltation** – The deposit of material carried in suspension.

**Site of Special Scientific Interest (SSSI)** – These are sites of national importance designated under the Wildlife & Countryside Act 1981 by English Nature in England.

**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.

## Abbreviations

AMP	Asset Management Plan	LA21	Local Agenda 21
AONB	Area of Outstanding Natural Beauty	LEAP	Local Environment Agency Plan
AVCS	Axe Vale Conservation Society	LNR	Local Nature Reserve
BAP	Biodiversity Action Plan	LPA	Local Planning Authority
BC	Butterfly Conservation	MAFF	Ministry of Agriculture, Fisheries and Food
BCU	British Canoe Union	NFU	National Farmers Union
BOD	Biochemical Oxygen Demand	NRA	National Rivers Authority
BOT	British Ornithology Trust	OFWAT	Office of Water Services
CLA	Country Landowners Association	RE	River Ecosystem
DAS	Devon Archaeological Society	RFO	Riparian/Fishery Owner
DCC	Devon County Council	RHS	River Habitat Survey
DETR	Department of the Environment, Transport and the Regions	RIGS	Regionally Important Geological Site
DWT	Devon Wildlife Trust	RQO	River Quality Objective
DoWT	Dorset Wildlife Trust	RSPB	Royal Society for the Protection of Birds
EDDC	East Devon District Council	SAC	Special Area of Conservation
EDCCS	East Devon Coast and Countryside Service	SSSI	Site of Special Scientific Interest
EN	English Nature	STW	Sewage Treatment Works
ESA	Environmentally Sensitive Area	SWT	Somerset Wildlife Trust
EQS	Environmental Quality Standard	SWWL	South West Water Ltd
FRCA	Farming and Rural Conservation Agency	UNESCO	United Nations Educational Scientific and Cultural Organisation
FWAG	Farming and Wildlife Advisory Group	UWWTD	Urban Waste Water Treatment Works
GQA	General Quality Assessment	WRT	Westcountry Rivers Trust
LA	Local Authority	WWSL	Wessex Water Services Ltd

## Units

°c	degrees centigrade	MI	megalitre
g	grams	MI/d	megalitres per day
ha	hectare	mm	millimetre
km	kilometres	ng/l	nanogram per litre
km <sup>2</sup>	square kilometres	<	less than
l	litres	>	greater than
m <sup>3</sup> /s	cumecs; cubic metres per second	≥	greater than or equal to
mg	milligrams	%	percentage

## References

- <sup>1</sup> Our Common Future, The World Commission of Environment and Development, 1987 (The Brundtland Commission).
- <sup>2</sup> United Nations Earth Summit, Rio de Janeiro 1992.
- <sup>3</sup> Important areas for marine wildlife around England [1993] English Nature.
- <sup>4</sup> An Environment Strategy for the Millennium and Beyond, Environment Agency, 1997, HO-9/97-199k-D-BABF.
- <sup>5</sup> European Council Directive of 8 December 1975 concerning the Quality of Bathing Water (76/160/EEC). Official Journal of the European Communities No. L31/1.
- <sup>6</sup> European Council Directive on Pollution Caused by the Discharge of Certain Dangerous Substances into the Aquatic Environment (76/464/EEC). Official Journal of the European Communities No. L129.
- <sup>7</sup> European Council Directive of 31 May 1991 concerning Urban Waste Water Treatment (91/160/EEC). Official Journal of the European Communities No. L135.
- <sup>8</sup> Water Resources Act, 1991
- <sup>9</sup> European Council Directive on Species and Habitats (92/43/EEC). Official Journal of the European Communities No. L206, 1992.
- <sup>10</sup> European Council Directive on the Conservation of Wild Birds (EEC/79/409).
- <sup>11</sup> The implications of future shoreline management on protected habitats in England and Wales – R & D Technical Report W150, Environment Agency.
- <sup>12</sup> Wildlife & Countryside Act 1981, HMSO
- <sup>13</sup> Lyme Bay – A Nature Conservation Assessment (1999), DWT.
- <sup>14</sup> European Council Directive on the Quality of Freshwaters needing Protection or Improvement in order to support Fish Life (78/659/EEC). Official Journal of the European Communities No. L22/1.
- <sup>15</sup> European Council Directive on the Protection of Groundwater Against Pollution Caused by Certain Dangerous Substances (80/68/EEC).

## MANAGEMENT AND CONTACTS:

The Environment Agency delivers a service to its customers, with the emphasis on authority and accountability at the most local level possible. It aims to be cost-effective and efficient and to offer the best service and value for money.

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

Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol BS32 4UD  
Tel: 01454 624 400 Fax: 01454 624 409

### ENVIRONMENT AGENCY REGIONAL OFFICES

#### ANGLIAN

Kingfisher House  
Goldhay Way  
Orton Goldhay  
Peterborough PE2 5ZR  
Tel: 01733 371 811  
Fax: 01733 231 840

#### SOUTHERN

Guildbourne House  
Chatsworth Road  
Worthing  
West Sussex BN11 1LD  
Tel: 01903 832 000  
Fax: 01903 821 832

#### NORTH EAST

Rivers House  
21 Park Square South  
Leeds LS1 2QG  
Tel: 0113 244 0191  
Fax: 0113 246 1889

#### SOUTH WEST

Manley House  
Kestrel Way  
Exeter EX2 7LQ  
Tel: 01392 444 000  
Fax: 01392 444 238

#### NORTH WEST

Richard Fairclough House  
Knutsford Road  
Warrington WA4 1HG  
Tel: 01925 653 999  
Fax: 01925 415 961

#### THAMES

Kings Meadow House  
Kings Meadow Road  
Reading RG1 8DQ  
Tel: 0118 953 5000  
Fax: 0118 950 0388

#### MIDLANDS

Sapphire East  
550 Streetsbrook Road  
Solihull B91 1QT  
Tel: 0121 711 2324  
Fax: 0121 711 5824

#### WELSH

Rivers House/Plas-yr-Afon  
St Mellons Business Park  
St Mellons  
Cardiff CF3 0LT  
Tel: 01222 770 088  
Fax: 01222 798 555



For general enquiries please call your local Environment Agency office. If you are unsure who to contact, or which is your local office, please call our general enquiry line.

#### ENVIRONMENT AGENCY GENERAL ENQUIRY LINE

**0645 333 111**

The 24-hour emergency hotline number for reporting all environmental incidents relating to air, land and water.

#### ENVIRONMENT AGENCY EMERGENCY HOTLINE

**0800 80 70 60**

For general information about flooding.  
BECAUSE FLOODS DON'T JUST  
HAPPEN TO OTHER PEOPLE

#### ENVIRONMENT AGENCY FLOODLINE

**0845 988 1188**



**ENVIRONMENT  
AGENCY**



*All enquiries to:*  
**Devon Area,  
Exminster House,  
Miller Way,  
Exminster  
EX6 8AS  
Tel: 01392 444000**