

EA - South WEST LEAPs Box 7.

Photo
Master

local environment agency plan

AXE & LIM

CONSULTATION DRAFT

DECEMBER 1999



**ENVIRONMENT
AGENCY**

Foreword


The Axe and Lim Local Environment Agency Plan (LEAP) aims to promote integrated environmental management of this beautiful and important area of Devon. It seeks to develop partnerships with a wide range of organisations and individuals that have a role to play in the management of the rivers and associated land.

This plan embodies our commitment to deliver improvements to the land, air and water environment.

This Consultation Draft sets out what we believe to be the environmental issues in the catchment, together with suggested actions both for ourselves and in partnership with others. It is being widely circulated both inside and outside the plan area and we are keen to draw on the expertise and interests of local people and their representatives.

We need your help. Please comment, as your views are important. Your support for the plan would be welcomed, as would any information, issues or concerns you may have.

Following this Consultation Draft the final Plan will be produced with an agreed programme of work for future protection and enhancement of this much loved and valued area. We will use these plans to ensure that improvements in the local environment are achieved, and we will report our progress annually.



GEOFF BATEMAN

Area Manager (Devon)

Your Views

We hope that everyone who has an interest in the environment of the Axe and Lim Catchment will read this report. Your views will help shape this plan.

Have we correctly identified the problems in the catchment?

Do you agree with the proposed actions?

Are there any issues you wish to highlight/comment upon?

Please send your response by 31 March 2000 to:

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The Environment Agency
Exminster House
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Exminster
Devon EX6 8AS
Telephone: (01392) 444000

Alternatively you may contact us via E-mail: **richard.parker@environment-agency.gov.uk**

We will publish the Action Plan in November 2000, taking account of the comments received.

Privacy Note: The information that you voluntarily supply in response to this consultation will be used by the Environment Agency to help fulfil its regulatory and monitoring functions. A summary may be made available to the public and the consultee (this will include your name and town) unless you specifically request otherwise, or indicate that your response is confidential. If you would actually prefer the full content of your response to be made available instead of a summary please indicate this in your response.

You have a right of access to the information that you have provided to us so that you can check that it is correct. If you do not think that it is correct you have the right to apply to court for it to be corrected and you have certain other rights in accordance with data protection legislation if you are unhappy with the way in which we attempt to satisfy your concerns.

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Published December 1999

The map displays the River Yarty catchment area, which is bounded by a dashed line. The catchment area is divided into four local authority areas: Taunton Deane Borough Council to the north, South Somerset District Council to the east, East Devon District Council to the west, and West Dorset District Council to the south. The River Yarty flows from the north towards the south, where it meets the River Axe. Other rivers and streams shown include the River Lim, River Coly, River Sydenford, River Axe, and various brooks such as Cory Brook, Umberne Brook, and Whitley Stream. Settlements are marked with grey areas and labeled, including Chard, Axminster, and Lyme Regis. The map also shows the coastline of Lyme Bay and the town of Seaton. A legend in the top right corner identifies the symbols for Settlement, Catchment boundary, and Local Authority boundary. A scale bar at the bottom right indicates a distance of 5km, and a north arrow is located next to it.

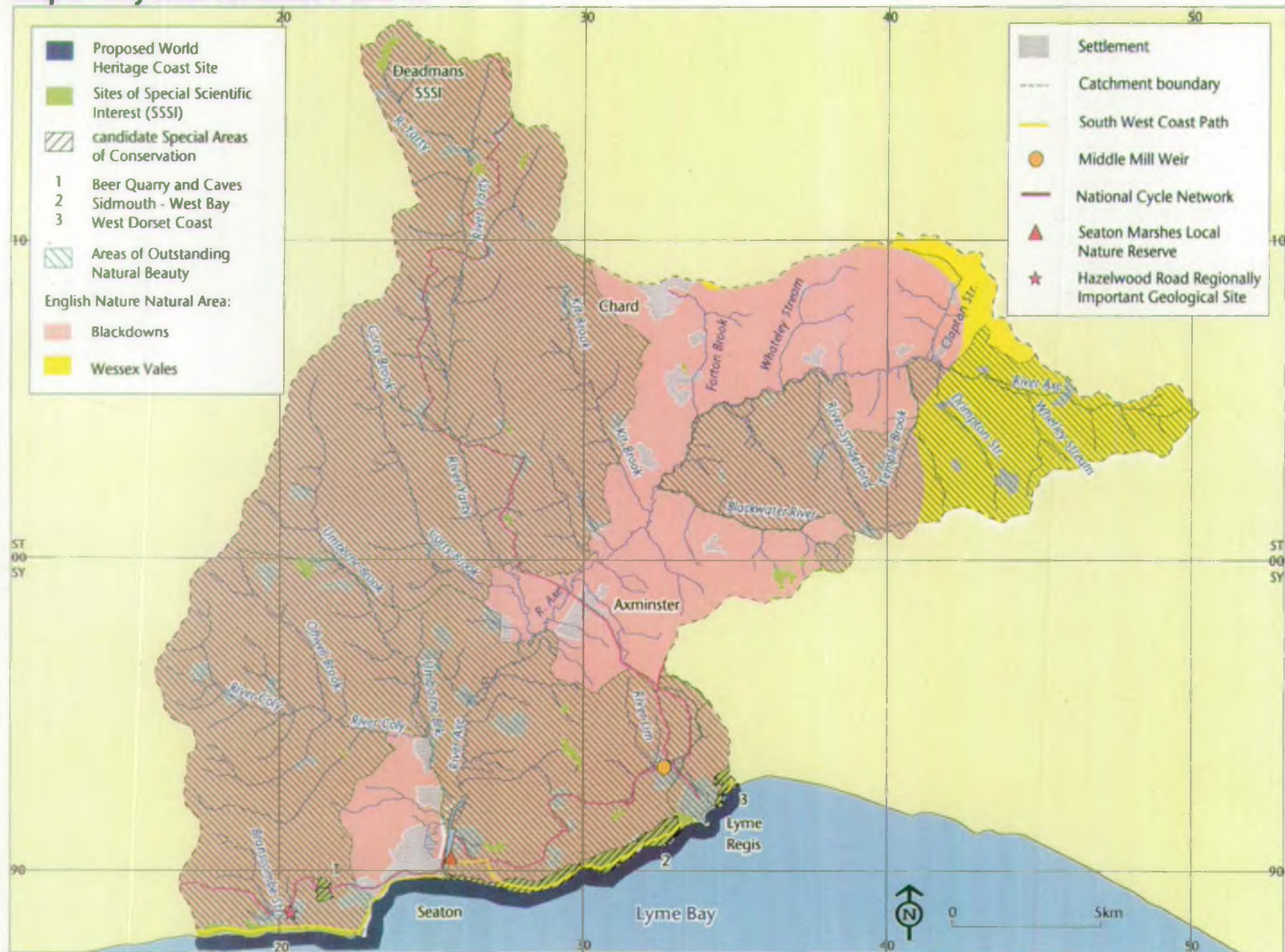


Map 3





Map 5 - Key Sites for Issues 9 and 10



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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 Appendix 2. 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*'¹.

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 precaution, 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 1992² 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 businesslike 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 (see Appendix 2) by producing this Local Environment Agency Plan (LEAP).

We are committed to a programme of LEAPs for all catchments in England and Wales. They help us to identify and 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:

The Consultation Draft - The publication of the Axe and Lim LEAP Consultation Draft marks the start of a three-month period of formal consultation enabling external organisations and the general public to work with us in planning the future improvements to the local environment. At the end of the consultation period we will produce a Statement of Public Consultation which will give the results of the process.

The Action Plan - The Action Plan will take into account the results of consultation and will be produced in November 2000. It will contain a list of actions that take account of costs and benefits, identifying timescales and partner organisations. Agreed actions will be incorporated into our annual business plans on a priority basis and bids made for appropriate funding.

The Annual Review - We will monitor implementation of the Action Plan and report on progress in a published Annual Review. This will be used to reassess the priority rating of actions for incorporation into that year's business plan. The Annual Review will also identify any additional actions needed to maintain progress in the light of any changes in the LEAP area, and also whether any actions need removing or amending where they are no longer appropriate. 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 conduct another consultation process, with a view to producing another Action Plan.

1.3 The LEAP Area

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

Key statistics for the Axe and Lim Catchment

Catchment Area	443 km ²
Location of source: River Axe	near Chedington, Dorset (ST 49 04)
River Lim	near Raymonds Hill, Devon (ST 31 96)
Population (1991)	40,000 (approx.)
Main Urban Areas	Axminster, Chard, Seaton, Lyme Regis
Average Annual Rainfall	945 mm
Length of river monitored for classification purposes	176.1 km
Administrative Areas (see Map1)	East Devon District Council, South Somerset District Council, West Dorset District Council, Taunton Deane Borough Council

2. Our Targets for Water Quality

This section describes how we monitor and manage water quality in the catchment.

2.1 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 National Water Council 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 A 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.

2.2 Compliance with RQOs

The rivers of the Axe and Lim Catchment 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	LT RQO
Lim	Source - Mean High Water	1	
Axe	A3066 Bridge Mosterton - Seaborough	2 (2000)	
Axe	Seaborough - Oathill Farm Wayford	2	1
Axe	Oathill Farm Wayford - A358 Bridge Weycroft	2	1
	A358 Bridge Weycroft - Bow Bridge	2	1
	Bow Bridge - Slymlakes	2	
Axe	Slymlakes - Whitford Bridge	2	
Axe	Whitford Bridge - downstream Whitford Abstraction	2	
Axe	Below Whitford Abstraction - Normal Tidal Limit	2	

River Name	Public stretch name	RQO	LT RQO
Coly	Source - Heathayne Farm	2 (2000)	
Coly	Axe	2 (2000)	
Umborne Brook	Axe	2	1
Umborne Brook	Triffords Farm - Coly Confluence	2 (2000)	
Offwell Brook	Source - Offwell	1	
Offwell Brook	Offwell - Coly Confluence	2	
Bruckland Stream	Source - Axe Confluence	2 (2000)	
Yarty	Source - Newhaven Bridge	2	1
Yarty	Newhaven Bridge - Beckford Bridge	1	
Yarty	Beckford Bridge - Axe Confluence	2	1
Corry Brook	Rose Farm - Yarty Confluence	2	
Kit Brook	Source - Axe Confluence	1	
Blackwater River	Source - Axe Confluence	2	1
Forton Brook	Source - upstream Tatworth STW	1	
Forton Brook*	Upstream Tatworth STW - Axe Confluence	2	1
Temple Brook	Source - Axe Confluence	2	
Clapton Stream	Source - Axe Confluence	3	2
Drimpton Stream	Source - Axe Confluence	2	1
Whetley Stream	Source - Axe Confluence	2	
Branscombe Stream	Source - Mean High Water	2	

* Forton Brook - following difficulties in establishing a monitoring point, sampling of this stretch commenced in January 1999. As a result no RE compliance data is yet available.

Map 2 shows where current water quality fails to meet its proposed RQO. This assessment is based on three years of routine monitoring data collected between 1996 and 1998 and held on public register. We have shown failures to meet proposed 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 catchment there is one stretch which significantly fails to meet its RQO, and five stretches (32.4 km) which marginally fail to meet their current RQOs. Six 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.

2.3 Biological Quality

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.

The biological scheme 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 Axe Catchment. Overall good biological quality was found at the majority of the sites. This was shown in the diversity and pollution-sensitive nature of the invertebrate fauna. Only one site on the main River Axe showed any decline in biological quality. This site was at Axe Bridge and appears to be the result of physical changes to the site.

Some minor changes in biological quality were found at a few sites on the tributaries. The Offwell brook had signs of sewage fungus 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. No problems were found at the other site on this river. The River Yarty was found to have a decline in biotic scores at one site only: Newhaven Bridge.

During 2000 we will be sampling the invertebrate fauna at all routine sites on the 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 documents.

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"³ 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:

	Theme 1	Addressing climate change
	Theme 2	Improving air quality
	Theme 3	Managing our water resources
	Theme 4	Enhancing biodiversity
	Theme 5	Managing our freshwater fisheries
	Theme 6	Delivering integrated river-basin management
	Theme 7	Conserving the land
	Theme 8	Managing waste
	Theme 9	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 1.1) and delivering our strategy in this catchment, 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 against 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.

Our everyday work commits substantial resources to managing the environment (see Appendix 2). The proposed actions listed in this report are required in addition to our routine work. However, where a routine activity is particularly relevant to an issue raised in this report, it is highlighted under that issue.

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.

Sewage treatment improvement plans - the water companies' improvement plan for the period 1995-2000 is known as Asset Management Plan 2 (AMP2). AMP2 was developed in 1994 along guidelines agreed between the National Rivers Authority (now the Environment Agency), the Department of the Environment (now the Department of the Environment, Transport and the Regions), the water services companies and the Office of Water Services (OFWAT).

OFWAT is undertaking a review of water prices that will result in a review of improvements required for the period 2000-2005 (AMP3) - see Section 4.6 - OFWAT and Asset Management Plans.

The following table shows sewage treatment works in the catchment where we expect improvements to be carried out under AMP3.

Table B Expected improvements to South West Water discharges under AMP3

Discharge	Receiving water	Required treatment level	Investment driver(s)	Latest end date
Seaton STW	Axe estuary	Ultraviolet disinfection	Bathing Waters Directive to achieve compliance with guideline standards at Seaton designated bathing water.	2005
Beer Head	Lyme Bay	Secondary treatment of existing untreated sewage discharge	Urban Waste Water Treatment Directive (UWWTD) (Appropriate treatment)	2005
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.	2005
Dalwood STW	Corry Brook	Improvement to remove aesthetic impact of storm sewer discharges.	UWWTD (Appropriate treatment).	2005

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 Combpyne. **Action 1a.**

EC Bathing Water Directive⁴ - There are four identified EC Bathing Waters in the catchment - Lyme Regis (Cobb), Lyme Regis (Church), Seaton and Beer. All of these bathing waters passed the mandatory standards of the directive in 1998. Their compliance history can be seen in Appendix 3.

Beer did not meet the guideline standards of the Directive in 1998. Sewerage works and improvements to the storm overflow at Beer have been completed. In addition, improvements for Beer Head outfall have been identified in AMP3. Also under AMP3 Seaton STW has been put forward for ultraviolet treatment to achieve compliance with guideline standards at Seaton beach.

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. Lyme Regis (Cobb) met the guideline standards of the Directive in 1998. However Lyme Regis (Church) did not and in 1997 failed to meet the mandatory standards.

Bacterial contamination of the River Lim may cause failure of the Directive standards at both Cobb and Church Beaches. Investigations have identified a number of potential sources of contamination; operation of storm overflows, diffuse pollution from land runoff and inputs from wildfowl. We are working with SWWL to investigate the operation of the storm overflows and to carry out further pollution prevention work, in 1999. **Action 1c.**

RQO non-compliance - The Umborne Brook - from source to Triffords Farm significantly failed to meet its long term RQO of RE1 in 1998 as a result of elevated BOD and 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. We are concerned that this discharge may contribute to poor water quality in the Umbourne brook. **Action 1d.**

Exceedance of EC Dangerous Substances Directive⁵ - 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 exceedance. 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. **Action 1e.**

Action 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 the following discharges in AMP3: Seaton, Beer Head, Tatworth and Dalwood. 	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	●				
e Review results of monitoring to see if exceedance of the EQS for lead recurs in the River Axe at Slymlakes. 	Agency	<1k	●				

Issue 2 Impact of Farming

Farming is the principal land use in the catchment, accounting for 93% of the catchment area (see Appendix 1). 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 catchment, farming has a significant impact on the environment.

Water pollution - Although the number of substantiated pollution incidents in the South West Region in 1998 dropped by 8.5% compared to 1997, the number of farm pollution incidents increased by 18%.

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 C shows failures of RQOs based on data between 1996 and 1998, which are considered to be related to agriculture. Nearly all of the failing samples were taken during rainy periods when river flows were increased, and were associated with elevated 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 C 1998 RQO failures considered to be related to agriculture

River Stretch	RQO	LT RQO	RQO failures	Long Term (LT) RQO failures
River Axe: Source to Seaborough	2	n/a	Marginal failure, BOD	n/a
River Axe: Seaborough-Oathill Farm Wayford	2	1	Marginal failure, BOD	Significant failure, BOD and ammonia
River Axe: Oathill Farm Wayford-A358 Bridge Weycroft	2	1	RQO achieved	Significant failure, BOD
River Axe: A358 Bridge Weycroft-Bow Bridge	2	1	RQO achieved	Significant failure, BOD
Whetley Stream	2	n/a	Marginal failure, BOD	n/a
Drimpton Stream	2	1	Marginal failure, BOD	Significant failure, BOD and ammonia
Temple Brook	2	1	Significant failure, BOD	Significant failure, BOD Marginal failure, ammonia
Blackwater River	2	1	RQO achieved	Significant failure, BOD
River Yarty: Source to Newhaven Bridge	2	1	RQO achieved	Marginal failure, BOD
River Yarty: Newhaven Bridge to Beckford Bridge	1	n/a	RQO achieved	n/a
River Yarty: Beckford Bridge to Axe Confluence	2	1	RQO achieved	Marginal failure, BOD

The Upper and Middle Axe is currently the target of a Farm Waste Management Campaign funded by the Ministry of Agriculture Fisheries and Food (MAFF) which runs from September 1999 to March 2000. Farmers are being 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.

Details of more wide-ranging initiatives are given below (see Sustainable Farming Initiatives below).

Siltation - 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 Axe catchment and work to de-silt 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 (see Issue 9 - Enhancing Biodiversity). **Action 12a.**

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 catchments may be investigated, and any actions for this catchment will be included in future reports. Disposal of sheep-dip to land is now governed by the Groundwater Regulations 1999, as described in Appendix 3 - EC Directives.

Routine.

Pesticide use - The area of maize grown for silage production within the catchment has increased substantially in the last 10 years. The growing of maize can give rise to problems associated with the use of herbicides. A persistent herbicide, atrazine, is used for controlling weeds in maize fields and low concentrations have been detected in the groundwater of some boreholes used for public water supplies in other catchments. Atrazine has been banned for non-agricultural use.

We have visited many farms providing advice on the use of pesticides, which has resulted in lower concentrations of atrazine being used. Alternatives are generally not considered to be as effective, but some farms are now using substitute methods for controlling weeds. We are part-funding an on-going study by Exeter University into the influence of atrazine on groundwater in the River Otter catchment. If levels are found to be significant in the groundwater of the Otter catchment, we will consider the implications for other catchments. **Action 2a + routine work.**

Sustainable farming initiatives - Clearly if the problems highlighted above are going to be resolved there needs to be significant improvements to farming practice in the catchment. The work described in the sections 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 catchment. 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 catchment, 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.**

Regeneration of bank-side trees - In recent years there has been a decline in general riverbank management due in part to rising labour costs and the advent of machinery capable of undertaking work which was previously manual. Bankside trees which in the past would have been managed by coppicing or pollarding, have developed full crowns and have been 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. The establishment of buffer zones to encourage natural regeneration (see above) can, to some extent, redress the loss. We encourage riverbank management by riparian owners in addition to bankside fencing and planting in appropriate locations, providing flood defence is not compromised (see Issue 9 - Enhancing Biodiversity). **Action 12a.**

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.**

Work to resolve many of the issues highlighted above will be carried out as part of our routine work, some of the key areas are given below:

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.

Promoting riparian fencing coppicing and planting schemes to reduce bank erosion.

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

Action 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 Catchment. 	Agency	1k		●			
b Seek external funding for a project to reduce diffuse pollution in the catchment. 	Agency, WRT Wildlife and Angling Interests	unknown	●	●			
c Support River Yarty Headwaters Project. 	Agency, Somerset Wildlife Trust	unknown	●				

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 are developing a national strategy for dealing with eutrophication, which will focus on a partnership approach to the management of this problem.

The Urban Waste Water Treatment Directive⁶ (UWWTD) requires higher standards of treatment for discharges to "Sensitive" Areas (see Appendix 3). "Sensitive" Areas are those waters that receive discharges from the equivalents of 10,000 people or more and are or may become eutrophic in the future. The Department of the Environment, Transport and the Regions (DETR) determine if a watercourse is sensitive based on studies undertaken by us. If sites are designated as sensitive, we are responsible for ensuring that discharges to them are improved.

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 nitrogen (N) and 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 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 show some decline on diversity; one factor contributing to this decline may be nutrient enrichment, but the results are not conclusive and further work is required.

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 is 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 activities, 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 SSSI. When this work is completed, we will be able to identify the actions required to reduce nutrient inputs to the catchment. **Action 3a.**

Action 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 catchment. 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 targets (see Section 2 - Our 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 customers 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 - The precise nature of contaminated land in the catchment is not fully known. New statutory guidance which will be enacted via the forthcoming 'Contaminated Land Regulations' (which implement the contaminated land provisions of the Environmental Protection Act 1990) will require local authorities to identify contaminated land within their area. (Records are currently held by the Environmental Health Departments.) Once these sites have been identified, it will be necessary to decide if remedial work is required. **Action 4a.**

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 are in the process of producing up-to-date and consistent maps of floodplains as part of our survey duties under Section 105(2) of the Water Resources Act 1991⁷.

The first stage, 'Level A', of the survey has now been completed and this shows the indicative floodplain areas for all the main rivers in the LEAP area. 'Level A' data have been provided to the local planning authorities in the catchment. Work has now started on the 'Level B' studies, which are concentrated in areas of proposed development or sensitive flood risk areas. 'Level B' studies are concentrated in a specific area and 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. **Action 4b.**

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 catchment on the Rivers Axe, Coly, Yarty and the Corry and Umborne Brooks. Tidal warnings are issued for the South Devon Coast.







A Major Incident Plan for warning of and response 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 has been conducted and enables levels of service to be compared across the whole South West Region.

The study has identified priorities for improvements and a programme of future work together with costs will be produced. A study is also programmed, for completion by the year 2000, into the tidal levels of service currently provided. This will similarly drive the regional capital programme for improvements to the tidal flood warning system. 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 4c.**

A30 Marsh to Honiton road improvements - This planned road development is the second part to the Exeter-Honiton improvements, which are under construction. We have commented in detail on the proposals, but understand that finance is still required for the scheme. The proposals involve upgrading the existing single carriageway between Marsh and Honiton to dual carriageway. The development will involve some construction near the upper River Yarty. We will continue to ensure, through advice and the giving of consent, that the environment is protected.

Action Table 4 - Impact of development

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
a Identify contaminated land sites in the catchment.  	Local authorities, Agency	unknown		●			
b Provide information (S105 Level B Surveys) to planning authorities to prevent inappropriate development in the floodplain.  	Agency, Local authorities	70k*			●	●	●
c Complete review of flood warning standards of service and where necessary improve flood warning at some locations.  	Agency	21k*		●			

*These are costs for the whole South West Region.

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.

Managing current demand - To manage water resources we issue abstraction licences to applicants to allow them to take specific volumes of water from specific sites. The abstraction licence may include conditions to control abstraction where environmental damage is likely. The abstraction licensing system for England and Wales was reviewed during 1997/98 and a number of changes were proposed and consulted on. *Taking Water Responsibly*⁸, a paper detailing the Government decisions following consultation, was published in March 1999 and is available from the DETR. The full nature and impact of changes will not be confirmed until the final papers are approved by Parliament. We will need to implement any changes that arise from this process and amend licensing policies as appropriate. Any relevant actions for this catchment will be included in future annual reviews.

Public water supply - We are not responsible for the supply of water to households and industry but have a central role in water resources planning in England and Wales. We contribute to protecting the environment by looking at current use of water in the home and at work and the water that is available for these uses without damaging the environment. This may involve correcting any imbalances or over-abstraction. We continue to protect the environment by comparing future demands for water with water availability and balancing the two in an environmentally sustainable manner. To achieve this we work closely with the water companies requiring them to submit detailed Water Resource Plans (see Section 4.6 - OFWAT and Asset Management Plans).

Water companies use areas known as Resource Zones in order to help manage the way in which they supply water. Most of this catchment forms part of SWWLs Wimbleball Resource Zone which supplies water to East Devon. This Resource Zone is supplied primarily by Wimbleball reservoir supported by a number of other smaller sources in the area. The remainder of the catchment is within The Wessex Water Services Ltd (WWSL) Wiltshire Resource Zone.

SWWL hold four abstraction licences for public water supply in the catchment; whilst WWSL hold one.

Meeting future demand - Water resource planning is carried out over large geographic areas often extending over several LEAP boundaries. It is therefore difficult to obtain data for a specific LEAP and the precise impact of new development on water resources in the plan area can be difficult to predict. 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.

Water resource planners use average water demand, when planning for future demand. Water demand obviously fluctuates throughout the year, especially in tourist areas where peak demands are experienced in the summer. Peak demands can be met by providing storage within the system. Wimbleball Reservoir provides this storage for most of the catchment.

Demand management involves a number of different initiatives including metering. Meters are installed in all new domestic properties connected to the water company supply and, SWWLs, and WWSLs domestic customers have the option to have their home metered, fitting of the meter is free for WWSL customers and will be free for SWWL customers from April 2000. Customers of both companies who have a garden sprinkler are asked to register it with the company.

Water companies have a duty to promote efficient use of water and we expect them to pursue this duty with imagination and vigour. SWWL and WWSL have both published water efficiency plans which contain strategies to deliver water savings by the customer.

Extra resources can be obtained from making savings through reducing leakage. The water companies are set leakage targets each year by the Government's financial regulator OFWAT. The companies have to meet these targets but can set lower ones if they wish.

Both SWWL and WWSL achieved their targets in 1997/1998 and are working towards achieving the tougher targets which have been set for 1999/2000.

A wide range of water-saving measures are detailed in the document *Saving Water - on the Right Tracks 2*, which can be obtained from us free of charge.





Non-public water supply abstractions and demand - It is possible that there may be local environmental problems associated with full 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 will be assessed through abstraction licensing procedures. These take into account the justified need for water and the demonstrated extent of provision of water-efficiency measures within the proposals.

Overall the catchment is not at risk of over-abstraction. However, one localised problem has been identified in the Umberne 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 action⁸ within a specified timescale, to alleviate certain damaging abstractions. We are currently working with the abstractor 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.**

Action 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 Umberne 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	●	●	●	●	

Issue 6 Managing our Freshwater Fisheries

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. 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 2000/2001.

We have taken over the Strategy for the Management of Salmon, launched by the NRA in February 1996. Salmon Action Plans will be developed for all salmon rivers in England and Wales with the following aims: safeguarding salmon stocks, maximising economic/social benefits, and ensuring long-term improvements. Each Plan will: describe the fishery and how it is performing; identify the key issues in each river system; set fishery targets and fishing effort controls and outline a programme of improvement. We intend to develop a Salmon Action Plan for the Rivers Axe and Lim during 2000. **Actions 6a, 6b, 6c.**

Barriers to fish movement - In the River Axe there are several major weirs, of which only some are passable to migrating fish. Fish movement is also restricted in a deprived stretch of the Umborne Brook (see Issue 5 - Impact of Water Demand).

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. Of lower priority are other structures within the 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 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 6d, 6e + 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 that commenced in April 1999 will attempt to quantify the problem by analysing a variety of data. If the decline is found to be real, the project will enter a second phase that will identify the causes, and make recommendations as to how to arrest the decline and improve wild trout stocks.

Until five years ago, some riparian interests within the catchment 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 catchment 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 6f + 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. We will work with local fisheries associations to investigate the current status of stocks. **Action 6g.**

Rainbow trout - There are a number of rainbow trout farms in the catchment 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 catchment 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 catchment. 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 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 6h + 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 6i + 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.**

Concern about the impact of sediments on the salmonid fishery is addressed in Issue 2 - Impact of farming under Siltation.

Much of our day-to-day activities contribute to resolving the issues above, some of this work is detailed below.

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.

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 Develop Salmon Action Plan for the River Axe in line with national guidance. 	Agency	5k	●	●			
c Continue programme of habitat improvements including including gravel rehabilitation. 	Agency, RFOs	2k p.a.	●	●	●	●	●
d Install fish passes, according to regional priority, on Lexhayne Weir and Wilmington Weir. 	Agency Riparian owners, angling associations	6k & 9k		●	●	●	
e Seek to have existing 'Irish Bridges' that restrict fish passage removed or replaced. 	Agency, County Councils	<1k p.a.	●	●			
f 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	●	●			
g 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		●			
h Implement findings of joint Agency/MAFF research on fish-eating birds where appropriate. 	Agency, MAFF, RFOs	unknown	●	●	●	●	●
i 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 Air Quality

Air pollution can damage flora, fauna and buildings and can have significant effects on soils and water. It can also pose a serious risk to public health.

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.

We are working with local authorities to help achieve the objectives of the Strategy, principally through our regulation of emissions to air from controlled ('Part A') major industrial 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 catchment, and therefore our role with respect to air quality in this catchment is limited. **Action 7a.**

East Devon District Council have completed the first stage of their review, which identified that of the eight pollutants detailed in the strategy, three of them - nitrogen dioxide, carbon monoxide and PM₁₀ (particles smaller than 10_{um}) - are at risk of exceeding their objectives for 2005. The Council will be conducting further (stage 2) studies into these pollutants. West Dorset District Council have completed both Stage 1 and Stage 2 reviews, and have identified that nitrogen dioxide and PM₁₀ require Stage 3 assessments. South Somerset District Council have identified that nitrogen dioxide, PM₁₀ , benzene, carbon monoxide and sulphur dioxide require Stage 2 assessments.

Action Table 7 - Impact of air quality

Proposed Actions		Action By Lead/Other	Cost to Agency (£)	Financial Year				
				00	01	02	03	04
a	Review air quality in the area, in line with National Air Quality Strategy and develop appropriate actions.	LAs, Agency	<1k p.a.	●	●			



Issue 8 Protection of the Historic Environment


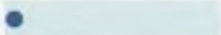




The catchment contains many sites and features of historic and archaeological interest. Although there is a wealth of information from a wide range of sources on the archaeological and historic value of the catchment, it is not in a useable format. Many organisations would benefit from the production of a simple document based on a rapid archaeological assessment of the wider area. This could cover either the wider catchment or fit political boundaries. **Action 8a.**

The Taunton Stop Line has been identified as an important feature of the catchment. 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 8b.**

There is also a possibility that submerged features may be damaged by our work, particularly in areas close to known archaeological sites.

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 8c.**

Action Table 8 - Protection of the historic environment

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
a Lack of archaeological information in a useable format – discuss options for a rapid archaeological assessment of the whole catchment with potential partners. 	DCC, Agency, EDDC, DAS, AVCS	<1k					
b Review Defence of Britain Project to identify any actions for the Agency regarding pill boxes. 	Agency	<1k					
c 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. 	Lyme Regis Town Council, Agency	<1k					

Issue 9 Enhancing Biodiversity

Biodiversity is the variety of wildlife and habitats. Since the signing of the Biodiversity Convention in June 1992, Biodiversity Action Plans (BAPs) have been produced, to protect and enhance biodiversity, initially at a national level and subsequently at regional and local levels. 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 contributed to the production of BAPs for the South-West and Devon⁹. Each National Plan identifies a Contact Point (responsible for stimulating action), a Lead Partner (responsible for preparing detailed work plans, directing resources etc.) and a Responsible Agency (allocates responsibility for actions).

We are the UK Contact Point and/or Lead Partner for 35 "priority" species in the UK Biodiversity Action Plan. These priority species are either globally threatened or rapidly declining within the UK. We still need to determine the distribution of many of these species, before assigning any relevance to this catchment. We nevertheless have sufficient information for several species:

Otters occur within the catchment and river shingle beetles may also occur. We are the Contact Point for Otter and river shingle beetles and we are joint Lead Partner for both. Other "priority" species listed within the national Action Plan require specific actions by us as a responsible body and some occur within this catchment. These include the marsh fritillary and the pipistrelle bat.

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 catchment is given in Appendix 4.

Biodiversity can also be protected through the designation of sites at a number of levels - internationally, nationally, regionally and at a local level.

International protection - Wetlands of international importance are protected under the Convention on Wetlands of International Importance and designated as Ramsar 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 Directive¹⁰ as Special Areas of Conservation (SACs) or the European Wild Birds Directive¹¹ as Special Protection Areas. The coastline of the catchment is considered of particular wildlife and geological/geomorphological importance and part of the coastline comprises the Sidmouth to West Bay candidate SAC, which includes Sidmouth to Beer Coast SSSI, Axmouth to Lyme Regis Undercliffs SSSI and a small section of the West Dorset Coast SSSI. The site supports a number of rare and uncommon plant species. Also designated under the Habitats Directive is Beer Quarry & Caves cSAC which supports populations of rare bat species.

Under the Habitats Directive¹⁰ we must use our powers to contribute towards the conservation objectives of these sites. We are currently reviewing existing permissions for activities that are likely to affect the SACs. Should any permission be found to be having an adverse effect on the integrity of a SAC we have a duty under the Directive to amend or revoke permissions as appropriate. **Actions 9a, 9b.**






National protection - In addition to the internationally protected sites within the catchment, there are sites of national conservation importance which are protected under the Wildlife & Countryside Act 1981¹², being designated as National Nature Reserves or Sites of Special Scientific Interest. The Axmouth-Lyme Regis Undercliffs are protected as a National Nature Reserve. A significant length (13km) of the River Axe has been designated a SSSI (see also Rivers, Streams and Fluvial Processes below and Issue 3 - Potential for Eutrophication). English Nature has 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.

Regional/local protection - 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 bye-laws). 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 Directive¹⁰ (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.

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 9c.**

Action Table 9 - Designations










Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
a Review all existing permissions for the cSACs in the catchment to identify which are likely to have a significant effect on the sites. 	Agency	unknown	●	●	●		
b Conduct assessments on identified permissions to establish any adverse effects.  	Agency	unknown			●	●	●
c Establish criteria for designation of rivers and streams as County Wildlife Sites and examine potential for creating demonstration sites for best working practice.  	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 Devon 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 catchment, although it is generally most abundant in the upper reaches of the catchment. 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 catchment. **Actions 10a, 10b, 10c.**

Target: Recreate 5 hectares (ha) of wet woodland (subject to ammendment following further information on catchment resource) by 2005

Action Table 10 - Wet woodland






Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
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.   	EN, DWT, Agency, FRCA, FWAG, NFU, CLA	<1k p.a.	●	●	●	●	●
b Identify areas of river valleys where tree planting can be encouraged without adversely affecting flood risks.   	Blackdown Hills Project, Agency	unknown	●				
c Create new areas of wet woodland through planting and appropriate management.   	Blackdown Hills Project, Agency	Dependent on action 10b		●	●	●	●

Springline mire & 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. These habitats include springline mires and Rhôs pasture (often with an associated heathland). 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 have 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, which breed here and barn owl which hunt for small mammals within the rough grassland areas. **Actions 11a, 11b, 11c and 11d.**

Target: Restore 20ha 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.

Action Table 11 - Springline mire & Rhôs pasture

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
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. 	DWT, EN, Agency, Blackdown Hills Project, SWT	<3k p.a.	●	●	●	●	
b Promote and implement actions from the Devon BAP for curlew & marsh fritillary by promoting sympathetic management and restoration of breeding sites. 	DWT, Blackdown Hills Project, SWT, EN, Agency, FRCA, Butterfly Conservation	1k p.a.	●	●	●	●	
c 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. 	Agency, BOT, SWT, landowners	1k p.a.	●	●	●	●	
d Support measures from the National Fen, Carr, Marsh, Swamp Reedbed Habitat Statement, and enter 80% of springline mire catchment resource into protective management by 2005.  	EN, Blackdown Hills Project, Agency	3k p.a.	●	●	●	●	

Rivers, streams and fluvial processes - The catchment supports a diverse range of in-stream habitats and species. The River Axe has been notified as a Site of Special Scientific Interest from Wadbrook to Colyford (approximately 13 kilometres). The site supports an exceptionally diverse aquatic and marginal flora, with interesting assemblage of plant communities in the upper reaches usually confined to the sandstone catchments in Scotland. Species of particular note within the SSSI 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 catchment is not restricted to the River Axe SSSI. Many of the rivers in the catchment 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 12a, 12b.**

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 is being undertaken of the invertebrates, particularly beetles, found in exposed riverine sediments on a number of rivers in Devon and Cornwall including one site on the River Yarty, near Axminster. Both the Axe and the Yarty have extensive meandering reaches where exposed riverine sediments are abundant. **Action 12c.**

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

There are a large number of species of conservation concern found within the catchment. Otters have partially recovered in numbers from the major decline of the 1960s and 1970s, although their distribution within this catchment is still patchy. Evidence suggests that otters are slowly colonising areas to the east of their stronghold in west Devon, however progress is slow. We are uncertain why otters have not populated areas as extensively as we might have hoped, but one significant factor in preventing spread is mortality caused by road traffic. We record otter deaths on roads and carry out post-mortems on retrieved corpses where possible to help achieve an understanding of the general health of the population, particularly with regard to the build-up of pesticides and other contaminants within the body tissues. The Devon Wildlife Trust's volunteer survey Operation Otter is gathering further information on the distribution of otters. The presence of otters has been recorded on the Axe, Yarty, and Coly. **Action 12d.**

Target: Restore breeding otters to 1970s distribution (following further investigations into potential factors limiting their expansion to subcatchments) by 2010.

The status of the nationally endangered water vole within the catchment is uncertain. Whilst we believe the species occurs within the Exe catchment to the west, we have no recent records for water vole within the Axe and Lim catchment. Water voles have experienced a catastrophic decline during the last fifteen years due, it is believed, to the interrelated factors of habitat loss and predation by mink. The species has been protected under the Wildlife & Countryside Act (1981)¹² since 1998 and the need for further action has been recognised. The recent publication of the "Water Vole Conservation Handbook" will no doubt stimulate interest in the species and also provide much needed guidance on survey and habitat management. We need to determine the status of the species within the catchment and where appropriate undertake habitat management to establish populations through colonisation or reintroductions. **Action 12e.**

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

We supported a county-wide survey of breeding sand martins and kingfishers during 1997. The results confirm both species breeding within the catchment. 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 appropriate, 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 catchment is unknown, although lamprey (species not verified) have been recorded within the River Coly and tributaries of the Axe and Yarty. We need to determine the status of each of the three species to determine whether any action is necessary to ensure the conservation of this species. **Routine.**

Target: Determine the status of Lamprey within the catchment by 2000

We are aware that signal crayfish have been found on the River Lim north of Uplyme. The native freshwater white-clawed crayfish has not been recorded within the catchment. We do not therefore believe that there is a threat of the fungus 'crayfish plague', which has devastated these native populations in other areas, being spread across the catchment, 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 12f.**

In recent years there has been a significant spread of a number of non-native invasive plant species throughout the catchment. 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 collating information on 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 catchment, namely on the River Lim and we have been providing advice to the landowner on how to eradicate this plant. It is likely that the species occurs elsewhere within the catchment. **Routine.**

We are also concerned about the spread of many non-native aquatic species, which are widely available to the public for use in garden ponds etc, species such as parrot's feather (*Myriophyllum aquaticum*), water fern (*Azolla filiculoides*), floating marsh-pennywort (*Hydrocotyle ranunculoides*) and swamp stonecrop (*Crassula helmsii*). Many of these species are vigorous growers and once released into the wild can spread rapidly at the expense of our native flora. We have no current records for any of these species within the catchment although we are aware that they have been found in the wild all over Devon. To discourage further spread, we have written to the relevant trade associations urging them to encourage garden centres and other suppliers to withdraw these plants from sale and help increase public awareness. **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 within the catchment and has continued to spread across the UK although there was a decline in the rate of spread during 1997. Evidence from the Forestry Authority suggests trees with severe crown symptoms may recover in subsequent years. Observations also suggest that the fungus may sometimes die out and that coppicing gives new growth a chance to develop. No planting of alder should be undertaken in areas liable to flooding where the disease is present and riparian owners should encourage natural regeneration of alder where possible.

Routine.

The following routine activities help to address some of the issues above, whilst specific actions are given in Action Table 12.

Routine Activity

Determine status of lamprey species in the catchment.

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.

Action Table 12 - Rivers, streams and fluvial processes

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
a 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. 	Agency, DWT, WRT, FWAG, EN	unknown	●	●	●	●	●
b 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. 	Agency, EDDC, EDCCS	unknown	●	●	●	●	●
c Implement recommendations of exposed riverine sediments invertebrate research and development. 	Agency, EN	2k p.a.	●	●	●	●	●
d 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. 	Agency, DWT, EN, DCC, LPAs	3k	●	●	●	●	●
e 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. 	Agency	2k	●	●	●	●	●
f 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. 	Agency	2k	●	●	●	●	●

Standing open water - There are a number of small areas of standing open water within the catchment ranging from ponds to ornamental lakes. Ponds are not a common feature of the Devon landscape, but do occur infrequently and 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 catchment from 1970 onwards and we have no reason to assume that the species is no longer found. We, therefore, need to improve our information on amphibians within the county, 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.

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

Action Table 13 - Standing open water

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
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 a county-wide database for amphibians. 	DWT, SWT, Agency, FWAG, LPAs, EN	unknown	●	●	●	●	●





Floodplain grazing marsh - In Devon, grazing marsh is only found in association with estuaries and much of this has been lost to agricultural improvement. Within the catchment a significant area of grazing marsh occurs along the margins of the Axe estuary and lower reaches. Although the grassland is generally improved, there is a network of species-rich ditches across the marsh.

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 contributed to a hydrological study to help achieve these aims. East Devon District Council is consulting widely with the residents in and around Seaton to maximise community involvement with the project. It is anticipated that we will continue to support this project. **Action 14a.**

With the financial hardships currently facing the farming community, it is becoming increasingly difficult to encourage management practices sympathetic to the needs of wildlife. We will, therefore, continue to seek to influence the levels of payments and priorities for agri-environment schemes through discussions with MAFF. **Action 14b.**

Targets: Restore 30ha 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.


Action Table 14 - Floodplain grazing marsh

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

Reedbed - This is not a common Devon habitat and the only significant area within the catchment is found within the Axe estuary along the north and western shores. Reedbeds are 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 catchment. **Action 15a.**

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

Action Table 15 - Reedbed


Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
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. 	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 wigeon, 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 management¹³ 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.

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 wigeon, lapwing and curlew.

Action Table 16 - Estuaries

Proposed Actions	Action By Lead/Other	Cost to Agency (£)	Financial Year				
			00	01	02	03	04
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. 	Agency, EDCCS	<1k	●	●	●	●	●

Sea cliffs & slopes and RIGS - The whole coastline of the catchment 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 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 dinosaurs.

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 Table 17 - 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 of the catchment 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 1981¹². 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 1998¹⁴. 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 10 Recreational Use of the Catchment

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 catchment 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 - No canoeing access agreements have been negotiated by the British Canoe Union (BCU) within the catchment. Much of the river is in private ownership and considerable angling activity already occurs within the catchment. To date we have not been approached by individuals or organisations expressing a particular desire to canoe within this catchment. It may be that other catchments within Devon would be more suited to the establishment of access agreements. We therefore propose no further action in this catchment at this time.

We launched a phone service called Rivercall during 1998, to provide information to river users (particularly canoeists and fisherman) 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 18a.**



Other water-based activities - Water-based recreation within the catchment is largely restricted to the coastal section, with beaches along the coast offering opportunities for swimming, diving and snorkelling. There is also a sub-aqua club at Seaton. Lyme Regis is home to a large and active water-ski and power-boating club. The Axe Estuary Harbour Management Committee are currently seeking new regulations to prevent water-skiing above the bridge.

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 18b.**

Walking - Most of Devon's rivers lie within private ownership and 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 and we would like to encourage the extension of the definition of "open countryside" to include appropriate lakes, rivers and coastal areas. 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 are important wildlife havens even if not covered by statutory designations. Where it can be achieved in co-operation with landowners and without adversely affecting the conservation value of the water environment, significant benefits for people can come from improved access to rivers and wetlands.

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 catchment 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.**

Action Table 18 - Recreational use of the catchment

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 Devon Cycle Route and appraised options. 	Sustrans, EDDC, Agency	unknown	●	●	●	●	●



Issue 11 Lack of Information on River Habitat

To make more informed management decisions in the catchment, 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 catchment, 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 Table 19 - 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 catchment.	Agency	6k					
	 							

4. 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.

4.1 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 catchment. 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 catchment. The Steering Group members are:

Name	Representing
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
Major General D H Braggins	Devon Fisheries Forum
Ms C Brewster	East Devon District Council
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

4.2 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.

4.3 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 Regis and South Devon Shoreline Management Plan (in preparation)
- Heritage Coast Management Plan
- English Nature Natural Area Plans
- Blackdown Hills AONB
- East Devon AONB

4.4 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 catchment, 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.

4.5 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 - This project seeks to draw these threads together to produce a strategy for Integrated Coastal Zone Management. This project is funded from the EU TERRA fund with funding matched by existing expenditure on coastal zone management in the area (including the LEAPs for Devon and Cornwall). It is intended that the outputs of the project will be extended to other coastal regions across Europe. We are represented on the project's steering group and several focus group which have been set up to examine various aspects of coastal zone management.

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.

4.6 OFWAT and Asset Management Plans

We are responsible for the environmental regulation of the water companies of England and Wales whilst OFWAT is responsible for the financial regulation. We work with the water companies in order to ensure best possible use of available resources.

OFWAT is undertaking a review of water prices that will result in a review of improvements required for the period 2000-2005; the outcome of this will be 'Asset Management Plan 3' (AMP3). Our proposals for the National Environment Programme for water companies from 2000 to 2005 were submitted to Government in May 1998 in the document *A Price Worth Paying*. Following consultation with ourselves and OFWAT, the DETR published guidance in September to OFWAT for the environmental and quality objectives to be achieved by the water industry in the period 2000 to 2005; this is the report *Raising the Quality*. This guidance has now been translated into detailed environmental obligations that have been agreed by the Secretary of State for each water company.

AMP3 also requires the water companies to revise their water demand forecasts, review their resource availability and consider any potential resource options to meet forecasted deficits within the planning horizon. In parallel with this we required the water companies to complete Water Resource Plans by March 1999. The Water Resource Plans require water companies to produce demand forecasts and compare them with their available resources for the next 25 years. Potential demand or resource-management options, including leakage reduction, have to be considered, and, if necessary, any resource-development options which may be required to meet the forecast demand. These plans have been received and a report on them, *Planning Public Water Supplies*, was sent to the DETR in June 1999. The companies will be expected to update these plans on an annual basis and the report also details the main changes we wish to see incorporated in the revisions of the plans.

The Water Companies are currently preparing their Strategic Business Plans which will confirm the delivery dates of their schemes for water supply and sewage discharge improvements. Many of these schemes will be delivered before 2005.

4.7 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>.

If you wish to obtain more information about anything presented in this Consultation Draft please contact the Team Leader at our Exminster Office (see front of document for address).

Appendices

Appendix 1: The LEAP Area

This section describes the area covered by the plan.

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 catchment 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.

Landscape - The landscape of the catchment 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 catchment 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 designated 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 catchment lies primarily within two of these Natural Areas, namely the Blackdowns and Wessex Vales (see Map 5).

Geology and soils - The solid geology of the Axe and Lim catchment is represented by rocks of the Triassic, Jurassic and Cretaceous Periods. In addition, large areas of the catchment 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 catchment, particularly where the Cretaceous Gault Clay outcrops along valley sides.

Slopes in the catchment 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 catchment 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 utilized 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 catchment. There are also ten instantaneous water level stations in the catchment which are used for flood warning purposes. A summary of flow statistics for the catchment is shown below.

Table C Summary of flow statistics for Axe and Lim Catchment

	Flow m ³ /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 catchment.

Habitats - The catchment drains towards Lyme Bay, which supports a diverse assemblage of marine communities of national importance¹⁵ 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 catchment, two sites are being considered as candidate Special Areas of Conservation under the EC Habitats Directive¹⁰ 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) contain some of the UK's best vegetated seacliffs (see Map 5).

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 RIG Site has been identified within the catchment, by the Devon RIGS group. There is a need to support the documentation of important geological sites within the catchment to determine the full extent of this resource and we will continue to support this initiative.

A large section of the catchment, particularly that including the River Yarty and Corry Brook, falls within the Blackdown Hills ESA. 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 payment 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 catchment are: springline mires/Rhôs pasture (including lowland heath), alder and willow carr, coastal flushes and estuarine habitat. Most of the best areas of these habitats are already protected by designation, but attention needs to be focused on those unprotected areas.

Species - Those of particular note and of relevance to Agency activities within the catchment 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 catchment can be found in Issue 9 - Enhancing Biodiversity.

Archaeology and heritage - The catchment 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 catchment; 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 notified to preserve and enhance their character. Some 15 settlements in the catchment contain Conservation Areas.

Archaeological evidence, notably stone axes from Broom (on the River Axe), suggests the presence of people in the catchment as long ago as the Palaeolithic period (more than 8,000 years ago). Populations would have been small, however, and signs of their activity are few. Later colonisation during the Neolithic and Bronze Age periods resulted in more prominent features such as tumuli and round barrows. It was also at this time that much of the initial clearance of native forest took place. 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.

The area was further developed during Roman times with the construction of a road leading from the Fosse Way towards Dorchester, crossing the River Axe near Axminster. There was also a route from Axminster down the Axe Valley to the Axmouth. The remains of a settlement site has been found at Seaton and a substantial villa outside of 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.

The port of Axmouth continued to be an important centre until the sixteenth Century when the appearance of a shingle bar first threatened to close off the estuary. 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.

Farming - Agricultural land accounts for 93% of the catchment area. MAFF Agricultural census data (1987-1997) shows the total farmed area in the catchment to be 28,909 hectares. The greatest use is for grassland. See table below.

Table D Agricultural Land Use

Agricultural Land Use (1997)	Area (ha)	% of total
Grassland	21,541	74.6
Rough Grazing	882	3.1
Crops and Fallow	4,449	15.4
Farm Woodland	1,380	4.8
Set-a-side	137	0.5
Other land	520	1.8

Information provided by Farming and Rural Conservation Agency

The catchment includes part of the Blackdown Hills ESA. ESAs are designated by MAFF and aim to encourage traditional farming methods to conserve and enhance the ecology, landscape and historic features of the area.

Forestry - Forests and woodland are widely scattered across the catchment, occupying approximately 10% of the total area. They range from scrub invading neglected pastures through to managed deciduous woodlands and coniferous monoculture.

Of the catchment's wooded area 26% is non-coniferous woodland, whilst mixed woodland covers approximately 56% of the wooded area. The largest examples include Offwell Woods, owned by the Forestry Commission and managed by Forest Enterprise, and the woods along the South West Coast Path.

Coniferous woodland only covers approximately 18% of the wooded area of the catchment. Ames Plantation in the River Lim Catchment and Farway Hill in the River Coly subcatchment are owned by the Forestry Commission and managed by Forest Enterprise.

Fisheries - Sea trout and brown trout are widespread throughout the River Axe catchment. Much of the spawning of both species takes place in tributaries of the main river, most importantly the River Yarty. Angling for sea trout and brown trout is widespread on the Axe and most of its major tributaries. Dace and roach are found in the lower reaches of the river although their numbers have declined markedly in the past 20 years.

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 found at most locations.

Recreation and amenity - Water-based recreational use of the catchment is largely restricted to the coastal section, with few sites on the river or estuary available to the public. There are no access agreements for canoeing within the catchment. 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 catchment.

Flood defence - We maintain a number of flood defence schemes in the catchment. Major schemes have been carried out at:

- Colyton and Colyford on the River Coly;
- Axminster, Stafford Brook and Seaton on the River Axe;
- Lyme Regis on the River Lim.

The built environment and development plans - The catchment lies mostly within East Devon District, but also includes parts of South Somerset District, West Dorset District and Taunton Deane Borough. New Local Plans all have environment protection policies, which should result in protection and enhancement of the environment through sustainable development.

Mineral extraction - There are four active quarries within the catchment, three in Devon and one in West Dorset. Sand and gravel are extracted at both Kilmington, near Axminster and at Chard Junction whilst the Cretaceous Middle Chalk is worked at Beer (Beer Stone) and Uplyme. Both of these are considered to be small-scale operations. In addition to chalk, sandstone is extracted from the Upper Greensand at Uplyme to supply the local market.

Waste disposal - There are 15 landfill sites (three of which are open), three civic amenity sites, two scrapyards, one waste transfer site and one treatment plant in the catchment. No specific waste disposal issues have been identified in this catchment.

Water abstraction and supply - Both rivers and groundwater are used for water supply in the catchment. Uses include public and private water supplies, fish farms, water power (including hydro-electric) and industrial use. Both Wessex Water Services Limited and South West Water Limited provide mains supplies within the catchment. Wimbleball Reservoir, located in the River Exe Catchment, is a major source of much of the catchment's public water supply.

Appendix 2: 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
Water Resources The Agency has a duty to conserve, redistribute, augment and secure the proper use of water resources.	<ul style="list-style-type: none"> Grant or vary water abstraction and impoundment licences on application. Revoke or vary existing licences to reinstate flows or levels to surface waters or groundwater which have become depleted as a result of abstraction, and are subject to a liability for compensation. Issue conservation notices to direct appropriate practices with regard to water resource issues associated with exempt dewatering activities. 	<ul style="list-style-type: none"> 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. Protecting the water environment from any adverse impact due to proposed major developments. 	<ul style="list-style-type: none"> The Agency is committed to water-demand management and will work closely with water companies and developers, local authorities and relevant organisations to promote the efficient use of water. The Agency acknowledges that new resources may be needed in the future and supports a twin-track approach of planning for water resource development alongside the promotion of demand-management measures. The Agency seeks to influence planning decisions for new development by encouraging the inclusion of water conservation measures in new properties, particularly in areas where water resources are under stress, and by ensuring that planning authorities allow for the lead time for resource development.

Agency Duty	The Agency has powers to:	The Agency has an interest (but no direct powers) in:	Partnership
<p>Flood Defence</p> <p>The Agency has a duty to exercise general supervision over all matters relating to flood defence throughout each catchment.</p>	<ul style="list-style-type: none"> • Control, through Land Drainage consents, of development within 8m 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). • Produce flood risk maps for all main rivers under S105 of Water Resources Act 1991. • Undertake works to main rivers using permissive powers. • Issue flood warnings relating to main river to the public, local authorities and the police. • Consent mineral working within 16m of main rivers. 	<ul style="list-style-type: none"> • Granting of planning permission throughout a catchment but especially floodplains where development can significantly increase flood risk. This permission is granted by local planning authorities. • Installation of surface water source control measures e.g. flood attenuation structures. • Supervising the maintenance of ordinary watercourses which is a local authority remit, but may impact on main rivers. • Installation of buffer zones which reduce flood risk and have significant environmental benefits. • Urban and rural land use and measures that can reduce flood risk or the need for watercourse maintenance. 	<ul style="list-style-type: none"> • 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. • 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.
<p>Water Quality</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"> • Issue discharge consents to control pollution loads in controlled waters. • Regulate discharges to controlled waters in respect of water quality through the issue and enforcement of discharge consents. • Issue 'works notices' where action is required to reduce the risk of pollution. • Prosecute polluters and recover the costs of clean-up operations. • Serve prohibition notices (with or without conditions) on highway authorities to require treatment and pollution measures for highway runoff. 	<ul style="list-style-type: none"> • The greater use of source control measures to reduce pollution by surface water runoff. • Prevention and education campaigns to reduce pollution incidents. • The provision of highway runoff control measures which is a highway authority remit. 	<ul style="list-style-type: none"> • 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.

Agency Duty	The Agency has powers to:	The Agency has an interest (but no direct powers) in:	Partnership
Air Quality The Agency has a duty to implement Part 1 of the Environment Protection Act 1990.	<ul style="list-style-type: none"> Regulate the largest technically complex and potentially most polluting prescribed industrial processes such as refineries, chemical works and power stations including enforcement of, and guidance on, BATNEEC and BPEO. Have regard to the government's National Air Quality Strategy when setting standards for the releases to air from industrial processes. 	<ul style="list-style-type: none"> The vast number of smaller industrial processes which are controlled by local authorities. Control over vehicular emissions and transport planning. 	<ul style="list-style-type: none"> 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.
Radioactive Substances The Agency has a duty under the Radioactive Substances Act 1993 to regulate the use of radioactive materials and the disposal of radioactive waste.	<ul style="list-style-type: none"> To issue certificates to users of radioactive materials and disposers of radioactive waste, with an overall objective of protecting members of the public. 	<ul style="list-style-type: none"> The health effects of radiation. 	<ul style="list-style-type: none"> 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. The Agency will work with the Nuclear Installations Inspectorate to ensure adequate protection of workers and the public at nuclear sites. The Agency will work with the HSE on worker protection issues at non-nuclear sites.
Waste Management The Agency has a duty to regulate the management of waste, including the treatment, storage, transport and disposal of controlled waste, to prevent pollution of the environment, harm to public health or detriment to local amenities.	<ul style="list-style-type: none"> Vary waste management licence conditions. Suspend and revoke licences. Investigate and prosecute illegal waste management operations. 	<ul style="list-style-type: none"> The siting and granting of planning permission for waste management facilities. This is conducted by the waste industry and local planning authorities. The Agency, as a statutory consultee on planning applications, can advise on such matters. Serve notices to require improvements to waste facilities or for the removal of waste. 	<ul style="list-style-type: none"> 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.

Agency Duty	The Agency has powers to:	The Agency has an interest (but no direct powers) in:	Partnership
<p>Contaminated Land</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"> Regulate the remediation of contaminated land designated as special sites. Prevent future land contamination by means of its IPC, Water Quality and other statutory powers. Report on the state of contaminated land. 	<ul style="list-style-type: none"> Securing with others, including local authorities, landowners and developers, the safe remediation of contaminated land. 	<ul style="list-style-type: none"> The Agency supports land remediation and will promote this with developers and local authorities and other stakeholders.
<p>Conservation</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"> The Agency has no direct conservation powers but uses its powers with regard to water management and pollution control to exploit opportunities for furthering and promoting conservation. 	<ul style="list-style-type: none"> The conservation impacts of new development. These are controlled by local planning authorities. Protection of specific sites or species, which is a function of English Nature. The Agency does, however, provide advice to local authorities and developers to protect the integrity of such sites or species. Implementation of the UK Biodiversity Plan for which it is the contact point for 35 species and one habitat. 	<ul style="list-style-type: none"> 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
<p>Landscape</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"> The Agency must further the conservation and enhancement of natural beauty when exercising its water management powers and have regard to the landscape in exercising its pollution control powers. 	<ul style="list-style-type: none"> The landscape impact of new development, particularly within river corridors. This is controlled by local planning authorities. 	<ul style="list-style-type: none"> 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.
<p>Archaeology</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"> The Agency must promote its archaeological objectives through the exercise of its water management and pollution control powers and duties. 	<ul style="list-style-type: none"> Direct protection or management of sites of archaeological or heritage interest. This is carried out by local planning authorities, County Archaeologists and English Heritage. 	<ul style="list-style-type: none"> 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.

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

Appendix 3: EC Directives

One way 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 Directive⁴ - 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, popular 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, 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 catchment as shown in the following table with their compliance history:

EC Bathing Water	1990	1991	1992	1993	1994	1995	1996	1997	1998
Lyme Regis (Cobb)	Pass	Pass	Fail	Pass	Beach Closed*	Pass	Pass	Pass	Pass
Lyme Regis (Church)	Fail	Fail	Fail	Beach Closed*	Beach Closed*	Pass	Pass	Fail	Pass
Seaton	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Beer	Pass	Pass	Pass	Pass	Fail	Pass	Pass	Pass	Pass

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

EC Dangerous Substances Directive⁵ - 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 are monitored under the Dangerous Substances Directive. The discharges are shown in the table below along with the receiving water compliance with the Directive 1996-1998.

Table E EC Dangerous Substances Directive sites within the Catchment

Discharge site(s)	Monitoring Monitored	List I substances Monitored	List II substances monitored 1995-1997	Compliance
Axminster (Kilmington) STW	River Axe at Slymlakes	Mercury, Cadmium, HCH*	Arsenic, Copper, Chromium, Lead, Zinc, Nickel	Compliant 1996, 1997, 1998. (See Issue 1)
Seaton (Main) STW downstream of STW/off yacht club	River Axe		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 Directive¹⁶ - 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 freshwater fisheries stretches designated in the Lim and Axe LEAP area; these are shown in the table below along with their compliance with the Directive 1995-1998.

River	Stretch	Type of fishery	Compliance 1995-1998
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 Directive¹⁷ - 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 Directive⁶ - The EC Directive concerning urban wastewater 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 Lim and Axe LEAP area require improvements under the UWWTD; these are Beer Head outfall, Tatworth STW and Dalwood STW.

Appendix 4: Species of Importance for Biodiversity

Table F Key Species within the Catchment 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	Rhōs pasture, spring-line mire & moorland		●		●	Biodiversity commitment
Reed bunting	Wet grassland & reedbed	●				Delivering action
Barn owl	Rhōs pasture, spring-line mire, moorland & rough grassland				●	Delivering action
Lapwing	Grazing marsh		●			Biodiversity commitment
Snipe	Rhōs pasture, spring-line mire & moorland		●			Biodiversity commitment
Atlantic salmon*	Rivers & streams		●		●	Delivering action
River lamprey	Rivers & streams		●			Biodiversity commitment
Brook lamprey	Rivers & streams		●			Biodiversity commitment
Sea lamprey	Rivers & streams		●			Biodiversity commitment
Marsh fritillary	Rhōs pasture & spring-line mire	●		●	●	Delivering action
Medicinal leech *	Rivers, streams & ditches	●				Biodiversity commitment
Short-leaved water - starwort	Rivers, streams & ditches					Biodiversity commitment, no action plan proposed
Invertebrates of Exposed Riverine Sediments	Riverine sediments	Specific species action plans developed under National BAP				Biodiversity commitment

* Specifically protected under the Habitats Directive

Table G Key habitats and species within the Axe and Lim Catchment

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

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 Officer 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.

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

STW	Sewage Treatment Works
SWT	Somerset Wildlife Trust
SWWL	South West Water Ltd
UNESCO	United Nations Educational Scientific and Cultural Organisation
UWWTD	Urban Waste Water Treatment Works
WRT	Westcountry Rivers Trust
WWSL	Wessex Water Services Ltd

Units

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

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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.

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

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