

local environment agency plan

AVON AND ERME
SECOND ANNUAL REVIEW
FEBRUARY 2001



ENVIRONMENT
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AVON AND ERME LEAP – SECOND ANNUAL REVIEW FEBRUARY 2001

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ENVIRONMENT AGENCY



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CATCHMENT VISION

The integrated management of the environment is a fundamental philosophy for the Environment Agency with Local Environment Agency Plans (LEAPs) taking a key role in this approach.

Our vision of the Avon & Erme catchment is of a healthy and diverse environment, managed in an environmentally sustainable way, balancing the needs of all those who live, work and visit the area. In an area of such outstanding natural beauty and ecological value, our plans will help to ensure that:

- discharges to the air, land and water do not harm the environment
- the abundance and diversity of wildlife and habitats in the catchment is maintained and where appropriate restored or enhanced
- there is maintenance of the natural hydrological cycle, including natural river and wetland functions and processes
- water is a valued resource and is used accordingly
- there is minimal risk to people and property from flooding
- waste generation is minimised and the quantity of waste requiring disposal is reduced through the principles of reuse and recovery
- features of archaeological and historic interest are conserved
- people's enjoyment and appreciation of the environment continues to grow.

Achievement of the vision will require close co-operation between many organizations and individuals. We recognise the importance of establishing links with local communities and representatives, and in working with local authorities.

Alan Burrows

CUSTOMER SERVICES MANAGER (DEVON)

SUMMARY

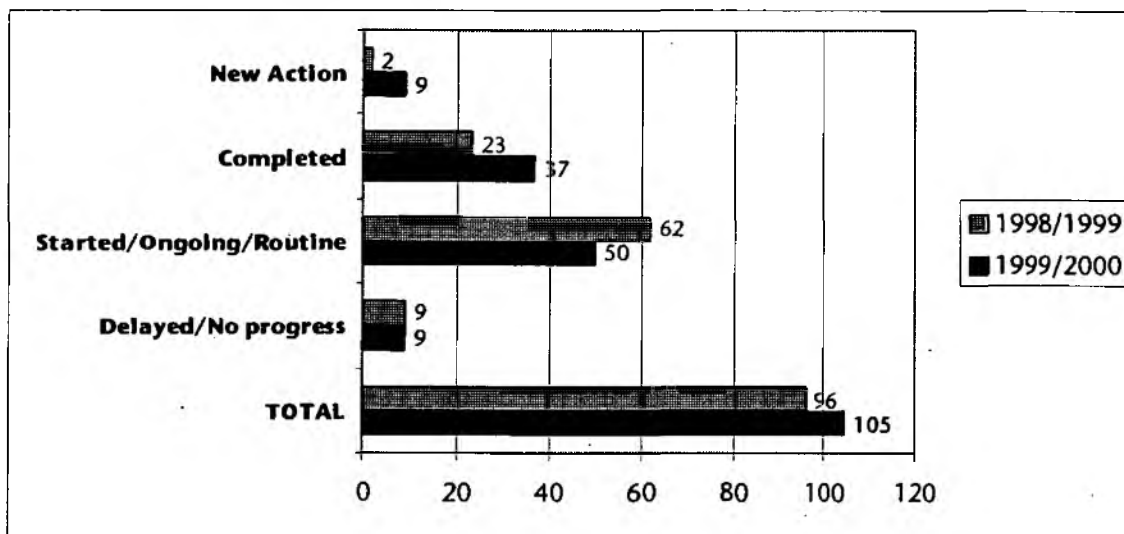
Good progress was made in the first year of this management plan and this has continued into the second year. The document has a total of 105 actions of which 50 have been started, 37 have been completed and 9 are new actions. Only 9 actions have made no progress.

We have secured improvements under AMP3 to the following Sewage Treatment Works: Kingston, Woolston, Brownston, West Charlton, Frogmore and Chillington, Stoke Fleming (North), Stoke Fleming (South), Torcross, Holbeton, Galmpton (Hope Cove), Strete, Ivybridge, Aveton Gifford and Kingsbridge (Gerston) which will further improve water quality.

We are making an application to the Heritage Lottery Fund for a project in the Slapton Ley area, which will help those living and working in the catchment to reduce their impact on Slapton Ley SSSI. We have made progress on a number of BAP targets and continue to support the Dartmoor Biodiversity Action Plan.

Progress on fisheries actions continues to be affected by a lack of funding, but habitat improvement work has been carried out in partnership with the River Avon Fishing Association. With cuts of approximately £1.5 million 'Grant in Aid' money for salmonid areas, our work on fisheries habitat improvement will be very much further restricted during 2001/2002.

Progress with Actions



Progress is indicated in the Action Tables by the following symbols:

- ✕ New Action
- Completed Action
- ▼ Started/Ongoing/Routine Work
- Delayed/No Progress

NB The symbols used for all Devon LEAP documents have been standardised therefore they differ in this document compared with the First Annual Review document.

1 INTRODUCTION

This is the Second Annual Review of the Avon and Erme Action Plan. It introduces the Environment Agency and summarises progress made with actions. Previous publications relating to this catchment contain more detail; this review should be read in conjunction with these publications:

- Rivers Avon and Erme Consultation Report – January 1998¹
- Avon and Erme Action Plan – December 1998²
- Avon and Erme First Annual Review – February 2000³

These publications are available on request from the Devon Area office of the Environment Agency.

1.1 The Environment Agency

The Environment Agency has a wide range of duties and powers relating to different aspects of environmental management. These duties and powers, together with those areas where we have an interest but have no powers to act, are described in more detail in Section 4. We are required and guided by Government to use these duties and powers in order to help achieve the objective of sustainable development. Sustainable development has been defined as *'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'*⁴.

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

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

One of the key outcomes of the United Nations 'Earth Summit'⁵ was agreement by governments that, to solve global environmental problems, local action is crucial: we must therefore all 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 major and continuous improvements in the quality of air, land and water
- encourage the conservation of natural resources, animals and plants
- make the most of pollution control and river-basin management
- provide effective defence and warning systems to protect people and property against flooding from rivers and the sea
- reduce the amount of waste by encouraging people to re-use and recycle their waste
- improve standards of waste disposal

- manage water resources to achieve the proper balance between the country's needs and the environment
- work with other organizations to reclaim contaminated land
- improve and develop salmon and freshwater fisheries
- tell people about environmental issues by educating and informing
- 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 on sound science and research
- valuing and developing our employees
- being efficient and businesslike in all we do.

1.2 Local Environment Agency Plans

We are committed to a programme of Local Environment Agency Plans (LEAPs). These plans 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. LEAPs replace Catchment Management Plans, which were produced by the former National Rivers Authority.

The LEAP process involves several stages as outlined below.

The Consultation Draft – Publication of the Consultation Draft¹ marked the start of a three-month period of formal consultation, which enabled external organizations and the public to work with us in planning the future of the local environment. At the end of the consultation period, we produced a Summary of Public Consultation Responses⁶ that gave the results of the process.

The Action Plan – The Action Plan² takes into account the results of the consultation. It includes numerous actions identifying costs, timescales and partner organizations. Agreed actions are incorporated into our annual business plans.

Some issues can be resolved through our statutory and routine work programme, whilst others require action over and above our day-to-day business. Funding for the latter is not always certain. Usually, because of the short-term nature of our funding, we can only firmly commit ourselves to action in the current and next financial years. Our priorities, policies and budget may change: these changes will be reflected at each Annual Review.

Some issues require solutions beyond the scope of our existing budgets or technology – they are nevertheless valid issues and earn their place in this plan, in the hope that a solution may be found in the future.

In most cases we show the anticipated cost against an action. These are estimated costs to give the reader an idea of the relative size and resource implications of each action.

The Annual Review – We monitor implementation of the Action Plan² and report on the year's progress in a published Annual Review. The Annual Review also identifies any additional issues and actions needed to maintain progress in light of any changes within the LEAP area. We invite people to contact us at any time to raise new issues or suggest new actions – this ensures the LEAP process is an active one, which evolves to meet the changing needs of the local environment. After five years, or sooner if required, we plan to carry out a major review of the progress we have made. At this stage, we intend to produce a new LEAP Consultation Draft.

Review of Progress – The following pages outline updates on the various issues, together with the relevant actions as set out in the Action Plan². A summary of progress is given for each action, together with target dates for future work, if applicable. New actions have been added where appropriate.

Future Reviews – We will review progress again in 2002 and details will be published in the Third Annual Review of the Avon and Erme LEAP.

Devon Area Business Plan – Our Business Plan sets out the activities that will be carried out in the Devon Area each year. It is based on national, regional and local priorities. Local priorities are defined through the LEAP process.

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

1.3 The LEAP Steering Group

The Steering Group represents a range of commercial, local authority, recreational and environmental interests. It commented upon the Consultation Draft and the Action Plan prior to public release. The group monitors the implementation of the Action Plan, providing us with specific advice on the importance of issues within the catchment. It acts as a communication link between our committees the local community and ourselves. It will help to promote and develop initiatives of benefit to the environment within the catchment. The Steering Group members are:

Name	Representing
Mr J Bloomer	South Hams District Council
Mr K Carter	Coast and Country Service: South Hams – South Devon
Mr K Chell	Field Studies Council – Slapton Ley
Mr J Coombes	River Avon Fishing Association
Mr S Day	English Nature
Mr D Ford	The National Trust
Ms S Goodfellow	Dartmoor National Park Authority
Mr A Mildmay-White	Erme and Yealm Riparian Owners Association
Mr N Mortimer	Salcombe Kingsbridge Marine Conservation Officer
Mr D Peters	National Farmers Union
Mr J Smith	Devon Avon Riparian and Fishery Owners Association
Mr S Tooke	Salcombe Harbour Authority (Harbour Master)
Mr C Trant	Local Fish Farmers
Mr M Williams	South West Water Limited
Mr C Wilson	Local Industry

1.4 Working With Others

We can only deliver long-term environmental improvement by working with others, building partnerships with those who share common objectives, and developing links with the community.

Local Agenda 21 – This is the global action plan endorsed at the United Nations Conference on Development and the Environment in 1992⁵. It is designed to achieve sustainable development within all levels of our society.

Within the catchment local authorities are assisting their local communities in developing strategies and action plans for sustainable development.

South Hams District Council has supported an independently produced Agenda 21 Plan⁷. This includes a series of recommendations for action that will act as a signpost for organizations and individuals to follow. Dartmoor National Park Authority endorses the Statement on National Parks, Sustainability and Work on Local Agenda 21; this statement provides a commitment to the pursuit of sustainability and Local Agenda 21 and forms the basis for future action.

Development Plans – These are produced by Local Authorities to guide the way land is developed. We have limited control over the development of land, but we provide advice and guidance to Local Authorities and work with them to develop policies that minimise the impact of development of the environment.

Non-Statutory Plans – We work with a number of other organizations to develop partnerships and collaborative projects. The LEAP is one of a number of separate, but related environmental initiatives that aim to protect the management of the environment. Other non-statutory plans include:

- The Nature of Devon: A Biodiversity Action Plan (BAP)⁶
- The Nature of Dartmoor: A Biodiversity Profile⁹
- Dartmoor Biodiversity Action Plan¹⁰
- Devon's Local Agenda 21 Network Issues Report¹¹
- South Devon Area of Outstanding Natural Beauty Management Plan¹²
- Lyme Bay and South Devon Shoreline Management Plan¹³
- Avon Estuary Draft Environmental Management Plan¹⁴
- The Salcombe Kingsbridge Estuary Environmental Management Plan²⁵.

1.5 Environmental Strategy

Our principal and immediate environmental concerns are stated in our national strategy¹⁵ and relate to nine 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 by dialogue between ourselves and the various organizations involved in the protection and management of the environment.

2 OVERVIEW OF THE LEAP AREA

The area covered by this LEAP comprises the adjoining catchments of the Rivers Avon and Erme. The Avon catchment includes those watercourses draining to Start Bay and to the Salcombe Kingsbridge Estuary (Map 1).

The Rivers Avon & Erme both rise on South Dartmoor within approximately one mile of each other, at a height of over 400 metres above sea level. Dartmoor is an upland granite mass, comprising open moorland with high rainfall and acid, peaty soils. Much of Dartmoor is used for extensive grazing by cattle, sheep and ponies. As the rivers flow from the open moorland they have created steep-sided valleys. Major tributaries of the River Avon (Bala Brook and Glaze Brook) and the River Erme (Lud Brook) have their sources on the moor.

The boundary of Dartmoor National Park is marked by the A38, which also serves as a boundary between the granite mass and the relatively low lying but undulating area known as the South Hams. The South Hams is noted for its rich red soil which supports more intensive livestock and arable farming. Slapton Stream and the Gara both have their sources in the area.

The Salcombe Kingsbridge, Avon and Erme estuaries are a major part of the landscape of this catchment. These are rias (drowned river valleys) which have a very different feel to the bar-built estuaries of East and North Devon. Woodland fringes come down virtually to the high tide line, and areas of saltmarsh or grazing marsh are quite restricted. Along the coast to the west of Start Point are several small areas of fairly flat land with steep cliffs down to the sea. Behind the shingle ridge, which runs from Torcross to Strete, lies Slapton Ley, the largest natural freshwater lake in the South West.

The upper reaches of the River Avon are intercepted by the Avon Reservoir, which provides water for public supply to the South Devon area. There are additional public water supply abstractions on the Bala Brook and the River Erme.

Industry in the catchment, apart from agriculture and tourism, is limited. The Salcombe Kingsbridge Estuary and Dartmoor National Park attract large numbers of visitors, especially in the summer months.

Key Statistics	Avon	Erme
Area of Catchment	341.25 km ²	107.75 km ²
Length of Monitored River in the Catchment (km)	67.10 km	28.90 km
Approximate Population (1991)	24,000	13,000
Main Settlements	Ivybridge, Kingsbridge, South Brent, Salcombe, Modbury	
Administrative Areas	South Hams District Council, West Devon Borough Council, Dartmoor National Park Authority	

2.1 1999 Compliance with River Quality Objectives (RQO)

River Quality Objectives are our targets for water quality. The system is described in both the Action Plan² and the Consultation Report¹.

For this review, we have looked at how current water quality compares with targets published in the First Annual Review. We used data collected over three years, between 1997 and 1999. The 1999 compliance with River Quality Objectives is shown on Map 2.

In comparison with the 1998 compliance assessment, there has been no change. The following five stretches have shown no RE class improvement or further deterioration and there were no new stretches failing:

The Gara from source to Higher North Mill – marginally failed to comply with its RQO of RE1 in 1999 as a result of elevated BOD occurring on three occasions. This stretch also marginally failed for BOD in 1998. The cause of the poor water quality of this stretch is not known, see Action 15a.

The Small Brook from source to the normal tidal limit – significantly failed its RQO of RE1 in 1999 due to three elevated BOD results. The most recent high result was in January 1999 and since then results have been compliant with the standard required. No further action is proposed unless water quality deteriorates in the future.

The South Grounds Stream from source to Slapton Ley Inflow – marginally failed its RQO of RE1 in 1999 as a result of elevated BOD. This stretch also marginally failed in 1998. The cause of the poor water quality is unknown, we hope to do an investigation in 2001 (see Action 15a).

The River Avon from Horsebrook to normal tidal limit (two stretches) – marginally failed its RQO of RE1 in 1999 due to elevated BOD. Both stretches were also marginal failures in 1998 for BOD. The elevated results were accompanied by elevated ammonia levels and are linked to rainfall events. The most likely cause of this poor water quality is diffuse agricultural pollution (see Action 2i).

In certain circumstances we can "set aside" data, that is we will not take into account some or all of the results for a particular determinand when we assess compliance with the RQO. We may "set aside" data where high concentrations of metals or low pH values are predominantly caused by the natural geology of the catchment. This allows us to protect good water quality shown by other determinands in the RE classification. The headwaters of the Avon and Erme catchment rise on Dartmoor, where the underlying granitic rocks result in very acidic soils. This, combined with the slight natural acidity of rain water, can result in lowered pH in these watercourses. The provision for pH to be "set aside" in the River Avon, from Avon Reservoir to Shipley Bridge, the entire Bala Brook and the Glaze Brook has been used in the 1999 compliance assessment.

2.2 Compliance with EC Directives

EC Bathing Waters Directive: There are fourteen designated Bathing Waters in the Avon and Erme catchment. All of the Bathing Waters within the Avon and Erme LEAP catchment complied with the mandatory standards of the Directive in 2000. Of the fourteen, ten were compliant with the more stringent guideline standards of the Directive. Mill Bay, Hope Cove and Mothecombe Beach failed to comply with the guideline standards of the Directive in 2000. Water quality at these Bathing Waters is likely to improve following completion of a number of AMP3 improvements, therefore no additional action is proposed.

Thurlestone North also failed to comply with the guideline standards of the Directive in 2000. We are going to undertake data analysis to identify whether an investigation is required (see New Action 12j).

EC Shellfish Waters Directive: The Shellfish Waters Directive sets standards to protect shellfish from the discharge of polluting substances and includes a guideline standard for bacteria in shellfish flesh, which is included to protect public health. Following a consultation exercise by the DETR on whether waters, including sites in the Avon and Salcombe Kingsbridge estuaries, should be designated under this Directive, the Government announced on the 8 July 1999 a revision of designated EC Shellfish Waters. As a result an area of the Avon Estuary and an area of the Salcombe Estuary were designated as Shellfish Waters (see Appendix One). We are responsible for controlling discharges to ensure the requirements of the Directive are achieved. This action by the Government ensures that the Shellfish Hygiene Directive and Shellfish Waters Directive are now running in parallel and their key aims of consumer protection and environmental protection will now complement and reinforce each other.

In order to achieve the standards for water quality as specified in the Shellfish Waters Directive, improvements will be required under AMP3 to nineteen intermittent sewage discharges and four continuous sewage discharges in the Avon and Erme catchment.

The two designated Shellfish Waters were compliant with the mandatory standards of the Directive in 1999.

EC Surface Water Abstraction Directive: The standards for colour and dissolved iron were exceeded at Avon Reservoir in 1999; runoff from the surrounding peaty, open moorland is considered to be a major contributing factor. No further action will be taken and a waiver has been applied for.

The standard for colour was also exceeded on the River Erme at Harford Moor in 1999; runoff from the surrounding peaty, open moorland is considered to be a major contributing factor. No further action will be taken and a waiver has been applied for.

EC Freshwater Fish Directive: Two stretches designated under this Directive failed the mandatory standards required in 1999.

The Gara at Slapton Ley failed for pH. The high pH values are thought to be caused by regular algal blooms which occur due to nutrient enrichment of the water body (see Actions 1i, 2i and 3h).

The River Avon at Avon Reservoir also failed for pH. The low, acidic pH values are naturally occurring as a result of the river draining an upland moorland catchment.

EC Dangerous Substances Directive:

List I Substances – There were no failures for List I substances in the LEAP area in 1999.

List II Substances – The River Erme at Sequers Bridge failed the standard for tri-phenyl tin (TPT) in 1999. The source of the TPT is unknown. No action is proposed in response to this one-off result. If further high results are recorded at this site we will investigate the source of the TPT.

3 PROGRESS WITH ACTIONS FROM THE AVON AND ERME ACTION PLAN

The following pages give updates for the actions from the Avon and Erme Action Plan December 1998 for the last year up to February 2001. The current status of each action is indicated by the following symbols in the left-hand column of the action tables (please note that the symbols have been standardised for all LEAP documents and therefore have changed since the First Annual Review document):

- | | | | |
|---|-------------------------|---|---------------------|
| ✕ | New Action | ● | Completed Action |
| ▼ | Started/Ongoing/Routine | ■ | Delayed/No Progress |

Key to tables:

- | | | | |
|-----|--------------------------------------|------|------------------------------|
| n/a | Costs not attributable to the Agency | >1k | Costs to Agency under £1,000 |
| u/k | Costs to Agency are unknown | p.a. | Per Annum |

Issue 1: Effluent Discharges

We regulate the disposal of effluent by issuing consents to control discharges, including treated sewage and industrial wastes. 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.

We aim to maintain and, where appropriate, improve the quality of water. We achieve this by setting water quality targets for the catchment based on RQOs to protect recognised uses, standards laid down in EC Directives and international commitments.

A number of South West Water Ltd sewage discharges are known to cause or contribute to the exceedence of water quality targets. These discharges will be improved through the Water Companies' investment programme for the period 2000-2005, known as Asset Management Plan 3 (AMP3). AMP3 has been developed along guidelines agreed between the Environment Agency, the Department of the Environment, Transport and Regions (DETR) the water services companies and the Office of Water Services (OFWAT).

Improvements to the following STWs will be carried out under AMP3.








STW	Required Treatment Level	Investment Driver	Completion Date
Kingston	Storm tank improvement and improved secondary treatment	Urban Waste Water Treatment Directive and protection of downstream River Quality Objective	31 March 2005 for secondary treatment and 31 December 2005 for storm tank improvements
Woolston	Secondary treatment and further improvements	Urban Waste Water Treatment Directive and protection of downstream River Quality Objective	31 August 2004
Brownston	Secondary treatment	Urban Waste Water Treatment Directive	31 March 2005
West Charleton	Storm tank improvements, improved secondary treatment, ultraviolet (UV) disinfection and reduction in storm discharges	Urban Waste Water Treatment Directive, protection of downstream River Quality Objective and Shellfish Waters Directive	31 August 2004




Frogmore & Chillington	Ultraviolet (UV) disinfection	Shellfish Waters Directive	31 December 2004
Stoke Fleming (North)	Primary treatment	Urban Waste Water Treatment Directive	31 March 2005
Stoke Fleming (South)	Primary treatment	Urban Waste Water Treatment Directive	31 March 2005
Torcross	Secondary treatment	Urban Waste Water Treatment Directive	31 March 2005
Holbeton	Secondary treatment and ultraviolet (UV) disinfection	Urban Waste Water Treatment Directive and Bathing Waters Directive	31 December 2001
Galmpton (Hope Cove)	Storm tank improvements, secondary treatment and ultraviolet (UV) disinfection	Urban Waste Water Treatment Directive and Bathing Waters Directive	31 December 2001
Strete	Outfall improvements	Urban Waste Water Treatment Directive	31 December 2004
Ivybridge	Storm tank improvements	Urban Waste Water Treatment Directive	31 August 2004
Aveton Gifford	Ultraviolet (UV) disinfection and reduction in storm discharges	Shellfish Waters Directive and Bathing Waters Directive	31 March 2001
Kingsbridge (Gerston)	Ultraviolet (UV) disinfection and reduction in storm discharges	Shellfish Waters Directive	31 August 2004
Slapton	Effluent phosphate reduction (depending on outcome of investigations)	To protect a Site of Special Scientific Interest	31 March 2005
Blackawton	Effluent phosphate reduction (depending on outcome of investigations)	To protect a Site of Special Scientific Interest	31 March 2005

Improvement to 32 intermittent discharges are also to be carried out under AMP3. The completion dates for these improvements range from 31 December 2001 to 31 December 2005. The investment drivers for the improvements vary. Six of the discharges require improvement under the EC Bathing Waters Directive, nineteen under the EC Shellfish Waters Directive and the remainder to meet the requirements of the EC Urban Waste Water Treatment Directive.

In the past the discharge at Avon Water Treatment Works has been identified as causing a decline in biological quality. This discharge has now ceased. A biological survey was undertaken in the Spring and Autumn of 1999 to determine the biological quality. The data from this survey shows a significant improvement downstream of the original discharge in comparison with previous surveys and indicates a recovery of the invertebrate fauna. The data is available to the public upon request from our Exminster Office. **Action 1c.**

Action 1d regarding the impact of septic tank discharges on the Buckland Stream was completed at the First Annual Review. The investigation found that septic tank discharges were impacting on water quality and it recommended that a follow-up survey during the Bathing Waters season was required. This follow-up investigation was carried out in the Summer 2000 in combination with an investigation into water quality at Bantham Beach. The results of the follow-up investigation will be available Spring 2001. **Action 1d.**

No	Action	Lead/ Other	Start	End	Cost	Progress
1a ▼	Improvements to be carried out under UWWTD to Holbeton STW (by 2005). 	SWW Ltd, Agency	01/12/98	31/03/05	n/a	We expect improvements to be made by the end of 2001, with provision of secondary treatment and UV disinfection under the water companies AMP3 programme.
1b ▼	Liaise with Centre for Environment, Fisheries and Science (CEFAS) to obtain more detailed information on the bacterial quality of shellfish. 	Agency	01/12/98	31/03/03	<1k	We have continued to liaise regularly with CEFAS. Sites in Salcombe Kingsbridge, Avon estuaries are continuing to be monitored as Shellfish Waters.
1c ●	Investigate the cause of poor biological water quality in the Bala Brook. 	Agency	01/12/98	31/03/00	u/k	Biological survey of 1999 shows significant improvement and indicates recovery of invertebrate fauna. Action completed.
1d ●	Carry out an investigation to determine the effect of unsatisfactory septic tank discharges on the Buckland Stream. 					Action completed at First Annual Review. The follow-up survey of Summer 2000 has been completed.
1e ▼	Continue discussion between SHDC, Parish Councils, SWW Ltd and the Agency regarding improvements to sewage discharge at Buckland. 	Owners/ Occupiers, Parish/District Councils, SWW Ltd, Agency	01/12/98	31/03/03	<1k	Further discussions in respect of first time sewerage at Buckland have taken place. The Parish Council and local residents will be contacting South West Water Limited in respect of a first time sewerage application.
1f ▼	Continue to seek restrictions on development in areas where sewerage and/or sewage treatment facilities are inadequate and pursue improvements to such discharges. 	Agency, SWW Ltd	01/12/98	31/03/03	u/k	We continue to do this as part of our routine planning liaison activities.
1g ▼	Investigate options for resolving environmental impact of Beeson STW. 	Agency, SWW Ltd	01/04/99	31/03/03	u/k	Work is ongoing to determine if the embargo on development is still appropriate. We are currently reviewing the environmental impact of Beeson STW and will be making any appropriate amendments over the forthcoming year.

No	Action	Lead/ Other	Start	End	Cost	Progress
Th ●	Investigate impact of Didworthy STW on the River Avon and seek improvements to the discharge. 					Action completed at First Annual Review. The STW performs within its consent.
Ti ▼	Investigate nutrient loading from Slapton and Blackawton STWs and seek any required improvements in AMP3.  	Agency, EN, SWW Ltd	01/04/99	31/03/03	u/k	A report is required from South West Water Limited by October 2001 outlining the impacts of the STWs on the Ley. The outcome of the report will determine if nutrient reduction may be required at Slapton and/or Blackawton STWs.

Issue 2: Agriculture







Agricultural activities impact on the environment in several ways, but over the last ten years there have been significant improvements by farmers in farm waste storage facilities and disposal methods. This has resulted in a marked reduction in the number of point source pollution incidents attributed to farming and has contributed to an overall improvement in water quality. Work still needs to be done to solve the problem of diffuse pollution. The Ministry of Agriculture Fisheries and Food (MAFF) provides guidance to farmers¹⁶ on minimising the risk of pollution to the environment.











We have been working with farmers to identify 'best farming practices' which aid them to conserve important resources such as soil, pesticides and fertilizers including slurries and manures. We are working with South Hams District Council to obtain funding from the Heritage Lottery Fund which would enable us to disseminate these 'best farming practices' to farmers in the Slapton Ley catchment. **Actions 2a and 2i.**

There is no evidence that sediment is impacting on habitat or species in the Salcombe Kingsbridge Estuary. Therefore an investigation into sediment sources was not considered justifiable and **Action 2e** was closed at the First Annual Review. However we encourage farmers to use appropriate practices (see Actions 2a and 2i). Also an awareness-raising event on practical soil conservation measures and grants for local farmers is being organised for Spring 2001 by the Marine Conservation Officer as support and part of the implementation of the Estuary Management Plans. **Action 2i.**

Research carried out by the University of Exeter, funded by the Agency and the National Environment Research Council, on the River Torridge has been completed and a report was produced in the Spring of 2000¹⁷. The catchment surface was found to be the principal source of suspended sediment. However, the fine sediment found in the artificial redds originated primarily from channel bank sources. Further work is needed on other catchments in order to confirm the wider applicability of the results obtained from the River Torridge. The techniques used to determine the impact of fine sediment on salmonid redds are being adopted nationally and the Agency is developing a national project on silt intrusion. **Action 2f.**

Authorisations are being issued to farmers in order to control the use and disposal of sheep dip (synthetic pyrethroids). The Groundwater Regulations now form part of the routine work of the Agency and will not be reported on in any further annual reviews (Action 2m). If a particular problem arises from the control and disposal of sheep dips in the catchment in the future a new action will be created.

No	Action	Lead/ Other	Start	End	Cost	Progress
2a ●	Target the South Hams coastal area for an intensive campaign promoting Farm Waste Management Plans (FWMPs). 					Action completed at First Annual Review. However the Agency is progressing a project with South Hams District Council which will address agricultural practices in the Slapton Ley catchment to reduce diffuse pollution caused by farming activities. See also Action 2i and 10i-b.
2b ●	Review results of the monitoring of the River Erme from Fawn's Bridge to the Normal Tidal Limit to see if RQO failures recur and take action as appropriate. 					Action completed at First Annual Review. This stretch was compliant with its RQO in 1998 and 1999.
2c ●	Investigate the cause of poor water quality in the South Grounds Stream. 	Agency	01/12/98	31/03/99	<1k	This action forms part of Action 15a, therefore is closed. See Action 15a for progress.
2d ●	Modify Habitat Scheme (Water Fringe option) to encourage greater uptake in the Gara and Start catchments. 					Action completed at First Annual Review. Existing agreements will continue until their natural end.
2e ●	Consider the need to investigate sources of sediment to the Salcombe Kingsbridge Estuary. 					Action completed at First Annual Review. See also main text above.
2f ▼	Conduct research into sediment intrusion into salmon redds and sources of sediment and use results to help prioritise remedial work. 	Exeter University, Agency, NERC	01/12/98	31/03/03	5k	Research carried out by the University of Exeter student on the River Torridge has been completed (see also text above).

No	Action	Lead/ Other	Start	End	Cost	Progress
2g ●	Continue gravel rehabilitation work to remove the build-up of silt and re-establish the gravels for salmonid spawning. 					Routine work, action completed at First Annual Review. However, limited works were undertaken on the Avon in late Autumn 2000. No sites were identified on the Erme.
2h ▼	Promote measures to reduce excessive bankside erosion (e.g. fencing, tree planting and coppicing) where appropriate.  	Agency, Landowners, Fishing Interests	01/12/98	31/03/03	u/k	Major habitat restoration project undertaken on the Bickham Brook (Avon) incorporating coppicing and fencing.
2i ▼	Encourage farmers to use appropriate Best Farming Practices to Protect Soils and Water. 	Agency, MAFF, FRCA, NFU, CLA	01/12/98	31/03/03	u/k	Distribution to farmers in the Slapton Ley catchment is planned during 2001, and wider dissemination is planned later. See also text above and Action 2a above.
2j ■	Review results of erosion mapping survey to be carried out by Oxford University and use results to help prioritise remedial work. 	Agency, Oxford University, FSC	01/04/99	31/03/03	<1k	No progress has been made to date on the mapping survey, but it is hoped a student may undertake such work in the future.
2k ▼	Explore opportunities for the application of beneficial agri-environment schemes (ESA, Countryside Stewardship, etc) at relevant locations.  	MAFF, FRCA, Agency	01/12/98	31/03/03	<1k	Environment Agency, FRCA and DNPA staff are meeting with the aim of forging closer working on agri-environmental schemes particularly Dartmoor ESA. Overgrazing is of particular concern in catchment. See Action 10d-a.
2l ●	Dependant on the findings of the Exmoor pilot scheme, investigate the presence of synthetic pyrethroids in Dartmoor streams. 					Action completed at First Annual Review. No evidence was found of an impact of these substances on invertebrate life in Dartmoor Streams.
2m ●	Implement new groundwater regulations to control use and disposal of sheep-dip (synthetic pyrethroids).  					Action completed at First Annual Review. The new regulations were implemented, see main text above.

Issue 3: Urban Development

Development in the catchment is largely restricted to the towns of Kingsbridge, Salcombe and in particular, Ivybridge. This issue addresses identified current and potential future problems associated with development in the catchment, which are of direct interest to the Agency.



The District Councils and the Park Authority control development within the catchment and we are a statutory consultee in the planning process. We work closely with the local planning authorities in order to influence the location and the type of development as an integral part of our work to protect and enhance the environment.










Floodline - Any person or organization who would like to receive direct flood warnings should contact us. Leaflets are available which give information on the service provided. Recorded information about current flood warnings in force at any time is available via FLOODLINE 0845 988 1188. Information packs on Floodline including advice on what action to take before, during and after a flood are also available from the Agency on request.

Contaminated land - The statutory guidance enacted via the 'Contaminated Land Regulations' (which implement the contaminated land provisions of the Environmental Protection Act 1990) came into force on 1 April 2000. As part of the Regulations the Agency liaises with the local authorities regarding contaminated sites in their area. The local authorities are responsible for producing and holding a public register of all the contaminated land sites in their catchment. The Agency is responsible for producing a database/public register for designated 'special sites' that are highlighted by the local authority. There are presently no contaminated land or 'special sites' designated in the Avon and Erme catchment. **Action 3d.**

Shoreline Management Plan - The Shoreline Management Plan was produced and adopted in 1999, so this action was completed at the First Annual Review. However, the Coastal Group is funding an extension to the Standing Conference on Problems Associated with the Coast (SCOPAC)-lead Sediment Transport Study to cover the coast from Lyme Regis to Start Point. Data and information collected in this study will lead to the further development of the Shoreline Management Plan. The Shoreline Management Plan will be updated every 5 years based on the data collected in the intervening period. **Action 3g.**

We have identified that water quality within Slapton Ley is impacted by activities in Slapton Village. We are hoping to address this via a Heritage Lottery Fund project with South Hams District Council. **Action 3h.**

No	Action	Lead/ Other	Start	End	Cost	Progress
3a ▼	Work with local planning authorities to ensure that policies to protect the environment from pollution are included in Local Plans. 	Agency, SHDC, DNPA	01/12/98	31/03/03	<1k p.a.	We continue to do this as part of our routine planning liaison activities.
3b ▼	Work with others to reduce the impact on water quality in the River Erme from drainage from construction. 	Agency, Developers, SHDC	01/12/98	31/03/03	u/k	As development at Ivybridge increases this is an on-going issue. We continue to seek conditions which will help to protect the environment and promote sustainable development as part of our routine activities.




No.	Action	Lead/Other	Start	End	Cost	Progress
3c ▼	Encourage local authorities to incorporate conditions in planning permissions which reduce the risk to the environment from construction. 	Agency, SHDC, DNPA	01/12/98	31/03/03	<1k p.a.	We continue to seek conditions which will help to protect the environment and promote sustainable development as part of our routine activities.
3d ▼	Produce database on contaminated land sites in the catchment and ensure there is effective consultation with local authorities regarding contaminated land sites.   	SHDC, WDBC, Agency	01/12/98	31/03/03	u/k	The LAs are responsible for producing a database/public register of all contaminated land sites in their area. The Contaminated Land Regulations (April 2000) give the Agency responsibility for 'special' sites highlighted by LA. There are no designated sites in the catchment.
3e ■	Consult and liaise with planning authorities regarding 'Level B' studies and provide floodplain mapping information as it becomes available (S105 Water Resources Act 1991).  	Agency, SHDC, DNPA	01/12/98	31/03/03	u/k	No Level 'B' studies have been undertaken to date within the catchment, such studies will only be undertaken when resources permit.
3f ▼	Agree programme for works at Slapton Ley to alleviate flooding of Torcross. 	SHDC, DCC, Agency, FSC, EN	01/12/98	31/03/03	u/k	SHDC, SWW Ltd have progressed some elements to alleviate this problem. DCC continue to rectify the problem for highway purposes when necessary.
3g ●	Produce Shoreline Management Plan for South Devon coastline taking full account of the importance of the shingle bank. 					Action completed at First Annual Review. The Shoreline Management Plan was produced and adopted in 1999. It will be updated every 5 years.
New 3h x	Work with others to reduce the impact on water quality in Slapton Ley from Slapton Village. 	Agency, SHDC, FSC, Villagers	01/04/01	31/03/04	30k	We will report on the progress of this new action in the Third Annual Review.

Issue 4: Barriers to Fish Migration

There are 34 weirs and other obstacles in the Avon and Erme Catchment, some of which are complete barriers to the migration of salmon and trout. Many of the works required on the weirs call for considerable expenditure to make them passable under all flow conditions. The Agency has limited resources to carry out these improvements and is now very reliant on external contributions and collaborative schemes to ensure that they are achieved.

There are abstractions at some sites in the system which create problems for the downstream migration of smolts. Installing screens at the river intakes of these abstractions alleviates the problem and we are working with abstractors in this regard. **Action 4a.**

Curtisknowle Weir - The Agency installed portable flow measurement equipment earlier in the Summer of 2000. The equipment has collected baseline flow data to aid understanding of the flow regime before any remedial works are undertaken to enable fish migration. It was important to collect this information during low flows as it is under these conditions when fish migration could be more affected. However, actual works to reposition the stones in the weir may have to be postponed to 2001 due to recent high flows. **Action 4c.**





No	Action	Lead/ Other	Start	End	Cost	Progress
4a ▼	Make abstractors aware of problems caused by inadequate screening and ensure screens are installed to Agency satisfaction and timetable. 	Agency, Abstractors	01/12/98	31/03/03	u/k	The Agency is working with abstractors in the catchment and seek to have solutions by the end of 2003.
4b ■	Modify man-made barriers in the system to permit fish passage. 	Agency, Fishing Associations, Riparian Owners, Others	01/12/98	31/03/03	u/k	There are no complete barriers of significant concern within either catchment.
4c ▼	Investigate and resolve unauthorised reinstatement works at Curtisknowle Weir. 	Agency	31/03/00	31/03/01	u/k	A gauging exercise was undertaken in the Summer of 2000. Remedial works are still to be carried out.

Issue 5: Additional Threats to the Salmonid Fishery

Many of the factors which influence numbers of migratory fish (salmon and sea trout) returning to the river to spawn fall outside our statutory responsibilities; for example, distant water fisheries and the Irish drift net fishery. This places particular importance on measures adopted locally to maximise the number of fish returning to spawn, and to ensure that conditions in the river system are favourable for successful spawning and survival. We will continue to campaign for a reduction in high seas netting, particularly the Greenland, Faroes and Irish Drift Net Fisheries.

The Government funding cuts has created uncertainty with regard to the production of the salmon action plans. It may result in no further plans being produced, but a decision on this matter is unlikely until early 2001. **Action 5a.**




Concerns are regularly expressed by various fishing interests that an increase in predation by fish-eating birds, principally cormorants, is adversely affecting the fishery. The results of a four-year research and development programme on inland fisheries in England and Wales were presented in London on 30 September 1999. Government sought the views from interested parties, including the Agency. We have suggested to Government that guidelines should be issued on how to demonstrate impact for the purposes of applications to MAFF to cull. We will only be in a position to determine our own approach to the recommendations in the R&D report once MAFF have announced their position statement. **Action 5c.**







No	Action	Lead/Other	Start	End	Cost	Progress
5a ■	Develop Salmon Action Plan. 	Agency	01/04/01	31/03/03	5k	Depending on funding may be started in 2001/2002.
5b ■	Seek designation of additional stretches of river under the EC Freshwater Fish Directive.  	Agency, DETR	01/12/98	31/03/03	<1k	There has been no further progress on this action. The DETR has not considered any further designations.
5c ■	Continue research into the effects of fish-eating birds. Disseminate findings of research and develop actions if appropriate. 	Agency, MAFF	01/12/98	31/03/01	u/k	Awaiting Government guidance.

Issue 6: Waste Management Activities

The National Waste Strategy¹⁸ sets out the Government's framework for the management of waste. It identifies ways in which waste can be managed in a more sustainable way, and sets out targets for achieving that aim through reduction, re-use, recycling, composting and recovering energy.

We are keen to promote the reduction of waste at source and continue to support business waste minimisation groups. Groundwork EBS (formerly known as PAYBACK), a business environment association working in partnership with Business Link, local authorities and ourselves initiate schemes for businesses to reduce waste at source, as part of a wider initiative covering the whole county. The first South Devon Waste Minimisation Group ran a successful project in 1999 and embarked on their second project in November 2000. We support this initiative and the success of the second project will be detailed in the Third Annual Review. **Action 6a.**

No	Action	Lead/Other	Start	End	Cost	Progress
6a ▼	Support Groundwork EBS/Business Link initiative to reduce waste at source.  	Groundwork EBS, Business Link, Agency, DCC, SHDC, TDC, TC	01/12/98	31/03/01	10k	The second South Devon Waste Minimisation Group started in November 2000.
6b ●	Provide advice to those companies affected by the Producer Responsibilities Obligations. 					Action completed at First Annual Review, it forms part of our routine work.

No	Action	Lead/ Other	Start	End	Cost	Progress
6c	Investigate closed landfill sites and take action as appropriate.  					Action completed at First Annual Review, see also Action 6d.
6d	Liase with the Waste Disposal Authority to provide a system of control of migration of landfill gas from Molescombe tip, and ensure a comprehensive monitoring and restoration plan is implemented. 	Agency, WDA	01/12/98	31/03/03	<1k	DCC prioritisation list has been produced. Molescombe has a low priority scoring therefore it will be sometime before Molescombe landfill is restored. We continue to work with Devon County Council (the WDA) to monitor the landfill gas at the site.
6e	Investigate any new information relating to fly-tipping at a site at Chillington and seek to prosecute offenders if possible. 					Action completed at First Annual Review. There has been a marked decrease in fly-tipping incidences at this site.
6f	Investigate options for cleaning up Chillington site with owner, Parish/District Councils. 	Agency, Site Owner, Parish/District Councils	01/12/98	31/03/01	u/k	It has been decided that this action cannot be carried out due to the unstable nature of the site, the health and safety implications/risks for Agency staff undertaking removal of the tipped waste. Action completed.
6g	Publicise the problem of fly-tipping to encourage the public to give information about suspected illegal waste tipping and to discourage them from tipping waste outside Civic Amenity Sites when they are closed. 					Action completed at First Annual Review. The situation at Ivybridge Civic Amenity Site had improved.

Issue 7: Water Abstraction





Water is an essential but finite resource. One of the Agency's roles is to protect the water environment (lakes, rivers and wetlands) from over-abstraction whilst considering the needs for water of the public, agriculture and industry.

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 continue to protect the environment by comparing future demands for water with water availability, and seek to identify options to balance the two in an environmentally sustainable manner. To help achieve this we work closely with water companies requiring them to prepare and submit their individual Water Resources Plans looking 25 years ahead. In addition, the Agency's national and regional water resources strategies are scheduled for publication in the Spring of 2001. These documents will consider the wider issues of how we can protect the environment and ensure reliable water supplies to 2025.

A region wide reassessment of available catchment resources started in April 2000 is known as Catchment Abstraction Management Strategies (CAMS). It forms a major part of a wide consultation exercise. From 2001 we will be investigating and assessing the availability of water resources within all catchments. The priority order of investigation has not been determined but assessment may lead to changes in abstraction licence conditions.

Harford Moor – There is a limited amount of biological data available to help identify whether low flows resulting from abstraction cause damage to the river downstream. This is to be analysed to see if there is any link between abstraction and any damage to the river. The adequacy of available data for this purpose will also be considered and any need for additional data will be established. **Action 7a.**

Avon Reservoir – There is insufficient biological data available to indicate that low flows resulting from abstraction cause damage to the river downstream. However, our professional judgement suggests that there would be little improvement to the river or salmonid populations if compensation flows from the reservoir were increased. Ways to get a better understanding of any need to increase compensation releases or make use of an existing 'fisheries bank' of water derived from the reservoir are being considered. **Action 7b.**

No	Action	Lead/ Other	Start	End	Cost	Progress
7a ▼	Investigate need and feasibility for increasing prescribed flow at Harford Moor intake on the River Erme.  	Agency, SWW Ltd	01/04/99	31/03/01	n/a	Available data is being analysed to determine whether there is a link between abstraction and any damage to the river. The adequacy of the available data will also be considered and a need for additional data established.
7b ▼	Investigate feasibility for increasing the compensation flow from Avon Reservoir.  	Agency SWW Ltd	01/04/99	31/03/01	n/a	Our professional judgement suggests that increased compensation flows will have limited improvement, but the matter will be given further consideration.

Issue 8: Cryptosporidium

Cryptosporidium is a microscopic animal that can infect the gut of humans and other animals. One species, *Cryptosporidium parvum*, can cause Cryptosporidiosis, a disease that produces prolonged severe diarrhoea in humans. *Cryptosporidium parvum* is thought to be widely present in the environment and may be found in cattle and sheep.

Occasionally outbreaks of Cryptosporidiosis occur in human populations, and the public water supply is often implicated in these situations. The risk of *Cryptosporidium* entering the water supply is thought to be greatest where there is a direct river abstraction, particularly in an agricultural catchment. SWW Ltd can abstract water for public supply at the Bala Brook and in the headwaters of the River Erme.

In response to the increased awareness of the potential risk to public health posed by this organism a task group was formed in 1997 with representatives from SWW Ltd, MAFF, Environmental Health Departments and the Environment Agency. This group has assessed the risk of *Cryptosporidium* entering the public water supply in the South West and SWW Ltd are reviewing procedures for the spreading of sewage sludge in catchments with potable supplies such as this one. The Environment Agency, in conjunction with MAFF, is also promoting the Code of Good Agricultural Practice in the same catchments.

Increasing awareness of the risk of *Cryptosporidium* entering groundwater and contaminating borehole water supplies has recently led to the need for risk assessment of potable groundwater sources. As part of a nation-wide initiative, SWW Ltd have been required by the Drinking Water Inspectorate (DWI) to complete an assessment of the risk posed to their groundwater sources and identify corrective action to mitigate risk where required. Following on from this work, we at the Environment Agency have initiated a review of our own network of groundwater monitoring positions across the South West to ensure the potential risk of transmission of *Cryptosporidium* to groundwater is minimised.











Issue 9: Air Pollution

Air pollution can damage flora, fauna and buildings and can have significant effects on soils and water. Sources of air pollution include traffic, industrial processes and power generation. These sources may be present within or outside the catchment. Ambient concentrations of air pollutants are generally lower in the South West of England than in other parts of England and Wales, although local data is limited. The National Air Quality Strategy¹⁹ requires local authorities to examine the air quality within their areas and, through a system of review and assessment, determine whether set standards and objectives for specific pollutants are likely to be met by 2005. South Hams District Council has completed their air quality review and they have concluded that there is no need to declare an air quality management area in the South Hams, which has been ratified by DETR. This action is completed. **Action 9a.**

Dartmoor has an extremely rich lichen flora, with a number of rare species that are sensitive to atmospheric sulphur. There is concern that around the southern edge of the moor, there is a decline in these species and possibly in other lower plants, such as mosses. More information is required to establish the status of these sensitive communities in the catchment. **Action 9b and 9c.**

Eutrophication – There is concern that the deposition of atmospheric nitrogen can act as a fertilizer and cause change to plant growth and lead to eutrophic conditions in the waterbody. The Institute of Terrestrial Ecology is carrying out a national monitoring programme for atmospheric ammonia to obtain a more accurate assessment of potential aerial nitrogen deposition. The National Environmental Research Council (NERC) has recently launched a research programme called Global Nitrogen Enrichment (GANE). The Web site can be found at <http://www.nerc.ac.uk/science/gane/summary.htm>. **Action 9d.**

Acidification – Moorland areas are typically acid due to the underlying geology and soils. Dartmoor's natural acidity may be exacerbated by atmospheric acid deposition. The main sources of acid deposition are sulphur dioxide and oxides of nitrogen, which dissolve in water to produce acid rain. These compounds result mainly from burning fossil fuels. There are no confirmed effects from atmospheric acidification in the catchment, but there is concern that the ecology of Dartmoor, in particular its watercourses, blanket bog habitat and associated species, may be affected by acid deposition. The Institute of Freshwater Ecology is conducting research for assessing acidification and could be used for examining any catchment-specific effects. **Action 9d.** Effects-based emissions control policies have been developed in the UK through a critical loads approach. The critical loads model assumes land use remains unchanged, however changes in land use could have significant effects on the level of acid deposition. Coniferous forests can also increase the level of acid deposition due to the way the forest canopy 'scavenges' pollutants from the atmosphere, and the acidic compounds released when pine needles break down. We have not received any proposals for forestry developments in this catchment. This forms part of our routine work so we will not report on this action in subsequent annual reviews. **Action 9e.**

No.	Action	Lead/ Other	Start	End	Cost	Progress
9a ●	Review air quality in the area, in line with National Air Quality Strategy. 	SHDC, DNPA, Agency	01/12/98	31/03/05	n/a	The air quality review has been completed by South Hams District Council. Action completed.
9b ▼	Improve knowledge of status of lichen communities sensitive to air pollution in the catchment. 	EN, DNPA, Agency	01/12/98	31/03/01	u/k	The Dartmoor BAP has included an action plan for mosses, lichens and ferns. This will enable prioritisation of survey and research work.
9c ▼	Co-operate in development of clean air quality standards to protect key species.  	EN, JNCC, Agency, DNPA	01/12/98	31/03/03	<1k p.a.	The Dartmoor BAP has an action to this effect and the Agency have influence through the planning process.
9d ▼	Conduct and support research to improve understanding of effects of airborne acidification and eutrophication on semi-natural habitats and species.   	Universities, Agency, EN, DNPA, ITE	01/12/98	31/03/03	u/k	Slapton Ley will be one of 40 shallow lakes in the UK to be sampled in the GANE research programme.
9e ●	Ensure all proposals for forestry development within the areas of critical load exceedences receive an environmental impact assessment where appropriate.   	Agency, Forestry Authority	01/12/98	31/03/03	<1k p.a.	No proposals have been received within critical load exceedence areas. This action forms part of our routine activities so will not be reported on in future annual reviews. Action completed.

Issue 10: Biodiversity and Earth Science

The conservation of Biodiversity, or the variety of life, has been recognised as an international issue. Biodiversity actions for the Avon and Erme LEAP area are aimed to be integral with and guided by the following documents: Biodiversity: The UK Steering Group Report²⁰, Action for Biodiversity in the South West (1997)²¹, The Nature of Devon: A Biodiversity Action Plan for Devon²², Action for Wildlife – the Dartmoor Biodiversity Action Plan²³ (final plan due February 2001).

The UK Biodiversity Action Planning process has continued to develop with Action Plans now extending to six volumes covering a very wide range of species and habitats. In addition the production of the Dartmoor BAP will guide priorities within the LEAP area. Additional habitats and species have been identified through the UK BAP process. We are the contact point or Lead Partner for a number of species, mainly the lower plants and invertebrates. Devon rivers have been found to be particularly valuable for river shingle beetles.

The Countryside and Rights of Way Act 2000 provides a statutory basis for biodiversity conservation until now undertaken as a matter of policy. Government Departments have a duty to have regard to biodiversity conservation. Procedures associated with the notification, protection and management of SSSIs are

improved, and legal protection for threatened species is strengthened. Management of Areas of Outstanding Natural Beauty is also improved.

The Environment Agency has produced "Focus on Biodiversity" ²⁴ which summarises the Agency's contribution to the national BAP process.

To avoid repetition we have not included previous introductory text on different habitats and are using this document primarily to update on actions. National and County targets for habitats and species have been set and we are progressively adapting them on a catchment scale. We have amended some of the previous, often generic targets, with more specific targets for the catchment. Some of the actions for Biodiversity and Earth Science have been reworded to rationalise and reflect the current status with Biodiversity Action Planning in the catchment.

10a: Loss/deterioration of key habitats and species in general






Although Action 10a-a was completed at the First Annual Review, we continue to contribute to Biodiversity Action Planning and earth science conservation. For this reason we have created a new Action 10a-e reflecting the ongoing and expanding nature of this process.









The Devon Biodiversity Steering Group are currently bidding for funding to allow the appointment of a Biodiversity Project Officer to aid the implementation of the Devon BAP. **New Action 10a-e.**

The Dartmoor National Park Authority together with other organizations is currently seeking funding to extend the remit of the extremely successful Dart Biodiversity Project to encompass the whole of Dartmoor under the title of the Dartmoor Biodiversity Project. **New Action 10a-e.**

There is ongoing management of UK BAP habitats at Slapton Ley, including: coastal shingle vegetation, eutrophic standing water, fen, reedbed, grazing marsh, wet woodland. The Field Studies Council hosted a wet woodland seminar and training day on 8 November 2000, at Slapton – a joint venture between the South Hams Woodland Campaign, Slapton Ley Field Centre and the Biodiversity Project of Devon Wildlife Trust. **New Action 10a-e.**

- 10a-d Targets: (i) *Promote the uptake of ESA so that 80% of eligible land is under agreement by 2005.*
- (ii) *Outside the ESA area, 80% of all County Wildlife Sites larger than 5 hectares to be entered into management agreements by 2005.*

No	Action	Lead/ Other	Start	End	Cost	Progress
10a-a ●	Continue to develop the Biodiversity Action Planning process at regional, county and more local levels to establish priorities for wildlife and earth science conservation.  					Action completed at First Annual Review, BAP documents have been produced. See also text above and Action 10a-e.
10a-b ▼	Promote and implement action plans, particularly for those features, habitats and species which may be affected by our operational or regulatory activities.   	Agency	01/12/98	31/03/03	5k	A number of new national action plans have been produced for which the Agency has responsibility, including BAPs for river shingle beetles and shore dock.

No	Action	Lead/ Other	Start	End	Cost	Progress
10a-c ▼	Work with others to ensure that prescriptions and payments, under agri-environment schemes such as ESA and Countryside Stewardship, are set so as to allow objectives to be met.   	MAFF, FRCA, Agency, Landowners	01/12/98	31/03/03	2k	We are working with FRCA to improve the links between agri-environment schemes and Agency objectives.
10a-d ▼	Encourage uptake of agri-environment schemes, particularly where there are benefits for target features, habitats or species.   	Agency, FRCA, Landowners, Managers, Others	01/12/98	31/03/03	1k	Presentations from FRCA have raised Agency Fisheries Ecology and Recreation field staff's awareness of the possibilities for agri-environment schemes. There are now 720 Dartmoor ESA agreements, which encompass over 40% of the total eligible area.
New 10a-e x	Continue to progress Biodiversity Action Plans and earth science conservation.  	Agency, Others	01/04/00	31/03/03	7k p.a.	The Devon Biodiversity Steering Group are bidding for funds to appoint a Biodiversity Project Officer. DNPA and others are seeking funds to extend the Dart Biodiversity Project for the whole of Dartmoor (see also text above).













10b: Loss/deterioration of blanket bog

The Moorland Fire Liaison Group has made good progress on co-ordinating burning on commons and the Dartmoor Commoners Council have drawn up fire plans for the North, East, and South Quarters of the Dartmoor Commons (the West will be drawn up in January 2001). **New Action 10b-e.**

Remote sensing, using aerial photography, is being used by English Nature to assess the state of blanket bog and to monitor future changes in vegetation.

The Environment Agency review of consents, under the Habitats Directive, for Dartmoor candidate Special Area of Conservation will have to be extended due to the inclusion in the notification of further interest features, including; Northern Atlantic wet heaths, European dry heaths, old sessile oak woods, southern damselfly, otter and salmon, as well as blanket bog. Actions 10b-a, 10b-b, 10b-c and 10b-d have been closed and incorporated into a **New Action 10b-e.**


10b-e Target: (i) *Achieve 90% of total resource in the catchment on Dartmoor under favourable management (with particular attention given to hydrologically linked sites and the effects of water abstraction) by 2005 and in favourable condition by 2010.*



No	Action	Lead/ Other	Start	End	Cost	Progress
10b-a ●	Increase public awareness of dangers of uncontrolled fires.  	DNPA, Devon Fire Brigade, Agency	01/12/98	31/03/03	<1k	This action has been combined into new Action 10b-e.
10b-b ●	Conduct research into effects of 'swaling' and changes to moorland vegetation on both catchment hydrology and nutrient leaching.   	Plymouth University, EN, Agency, DNPA	01/12/98	31/03/02	2k p.a.	This action has been combined into new Action 10b-e.
10b-c ●	Promote and implement action plans for blanket bog and associated species from forthcoming Dartmoor BAP. 	DNPA, EN, Agency, MAFF	01/12/98	31/03/03	2k	This action has been combined into new Action 10b-e.
10b-d ●	Review all existing authorisations and activities that we licence within Dartmoor candidate SAC.   	Agency, EN	01/12/98	31/03/04	<1k	This action has been combined into new Action 10b-e.
New 10b-e x	Implement actions from Dartmoor BAP for blanket bog – includes prevention of uncontrolled burning to protect hydrology and research the effects of 'swaling'.   	DNPA, Devon Fire Brigade, Agency, EN, MAFF, Plymouth University	01/01/01	31/03/04	8k	The Moorland Fire Liaison Group has made good progress. English Nature have issued a policy statement for burning, see also text above.

10c: Loss/deterioration of valley mire

Dartmoor BAP has a target to establish the location of all valley mires by 2001.


10c-c Target: (i) *Ensure all located valley mires are maintained or restored to a favourable management condition (eg in terms of hydrology) by 2005.*

No	Action	Lead/ Other	Start	End	Cost	Progress
10c-a ●	Promote and implement action plans for valley mire and associated species from Dartmoor BAP. 	DNPA, EN, Agency, MAFF	01/12/98	31/03/03	2k	This action had been combined into new Action 10c-c.

No	Action	Lead/ Other	Start	End	Cost	Progress
10c-b ●	Support survey to determine dragonfly interest. 	BDS, DNPA, Agency	01/12/98	31/03/01	<1k	This action has been combined into new Action 10c-c.
New 10c-c ✘	Promote and implement actions for valley mire and associated species from Dartmoor BAP, including Scarce Dragonflies Action Plan which includes priorities for surveys to determine dragonfly interest. 	DNPA, EN, Agency, MAFF, BDS	01/01/01	31/03/03	3k	English Nature are using aerial photography to assess the state of valley mire.

10d: Loss/deterioration of upland heathland

10d-a Target: (i) *Maintain moorland on Dartmoor with >25% dwarf shrub cover and restore 75% of degraded heath, within the catchment, to >25% dwarf shrub cover by 2005 and restore 90% by 2010.*


No	Action	Lead/ Other	Start	End	Cost	Progress
10d-a ▼	Promote and implement action plans for upland heathland and associated species from Dartmoor BAP. 	DNPA, EN, Agency, MAFF	01/12/98	31/03/03	1k	English Nature give assistance to owner/occupiers on ESAs as part of their day to day work. This includes advice on issues such as overgrazing and cross compliance.

10e: Loss/deterioration of Rhôs pasture

Management work is continuing on Rhôs pasture sites under management agreements with the Dartmoor National Park Authority.

10e-a Target: (i) *Achieve a minimum of 75% of Rhôs pasture under management agreements with DNPA and/or within the Dartmoor ESA by 2001, with 90% by 2010.*

(ii) *Assess the potential for restoration of Rhôs pasture by 2001, to include targets for 2010.*

No	Action	Lead/ Other	Start	End	Cost	Progress
10e-a ▼	Promote and implement action plans for Rhôs pasture and associated species from Devon BAP and Dartmoor BAP. 	DNPA, EN, Agency, MAFF, Barn Owl Trust	01/12/98	31/03/03	3k	The Devon Wildlife Trust newsletter 'Culm Connections' continues to be produced informing on Rhôs pasture issues and actions. Butterfly Conservation have produced 'A guide to managing damp grassland' to benefit the marsh fritillary butterfly.

10f: Key catchment habitats and species associated with the freshwater environment

Much of **New Action 10f-d** is covered by the Agency's routine operational activities. Where we carry out works, we seek opportunities to protect and enhance conservation value of watercourses and wetlands. We discourage modifications such as culverting, inappropriate bank protection techniques and interference with natural channel features.

A variety of flood plain habitats at Slapton Ley are managed for nature conservation (see also text for Action 10a-e).

We are planning to work with a landowner at Knapp Mill on the Avon to erect bankside fencing to encourage riparian vegetation and protect banks from poaching. **New Action 10f-d**.



10f-d Target: *Ensure no net loss of river length and natural features. Restore 10km of river channel and 10 hectares of floodplain by 2010.*

10f-e Target: *Ensure no net loss of habitat and create 1 hectare of new reedbed by 2010.*







10f-f Target: *Safeguard and strengthen breeding otter populations on all watercourses and major water bodies within the catchment.*

10f-g Target: (i) *Ensure the protection of all known bat roosts. Achieve a 30% increase in the population of greater horseshoe bats within the catchment by 2010.*

(ii) *Achieve 10 site enhancement and protection initiatives for bats by 2003.*




No	Action	Lead/ Other	Start	End	Cost	Progress
10f-a	Rivers and streams - implement flood plain policy, identify additional stretches of river bank that require active management to conserve or enhance wildlife, ensure Drought Orders and Permits do not compromise wildlife and ecology of watercourses. 	Agency, SWW Ltd, DWT	01/12/98	31/03/03	u/k	This action has been reworded into new Action 10f-d.
10f-b	Freshwater reedbed - encourage development of sympathetic water abstraction policies and appropriate coastal zone management plans in order to protect existing reedbeds. Advise on economic benefits of reedbed management as well as wildlife value. encourage use of reedbeds for pollutant/sewage effluent treatment. 	Agency, Marine Conservation Officer	01/12/98	31/03/03	u/k	This action has been reworded into new Action 10f-e.

10g: Threats to key bird species

No	Action	Lead/ Other	Start	End	Cost	Progress
10g-a ●	Carry out county-wide survey of sand martin and kingfisher nest sites.  					Action completed at First Annual Review. Survey completed 1997 no plans for a further survey.
10g-b ▼	Support research to determine effects of acidification on dipper populations.  	Agency, BTO, Universities	01/12/98	31/03/01	<1k	This action is ongoing.
10g-c ▼	Record dipper nest sites and pass information to county highways section in relation to bridge repairs.  	Agency	01/12/98	31/03/03	<1k	We continue to advise the Highways Authority of known nesting sites when we are consulted by them with regard to bridge repairs.



10h: Threats to key fish species





A range of activities threaten salmon. Actions for this species are covered in Issues 2, 4 and 5 of this Annual Review.

No	Action	Lead/ Other	Start	End	Cost	Progress
10h-a ▼	Improve knowledge of the distribution and abundance of bullhead and lamprey species, ensuring lampreys are identified to species level in fisheries surveys.   	Agency	01/12/98	31/03/01	<1k	Species abundance has been recorded during the routine electric fishing surveys, 2000. However, juvenile lampreys are very difficult to differentiate and so are only noted to family level.

10i: Threats to freshwater lagoon habitats

Work carried out at Slapton Ley in 2000 includes: annual submerged macrophyte survey undertaken in August; study of stoneworts in early July; regular monitoring of great-crested grebe numbers and behaviour throughout the season, and fish records throughout the season. **Action 10i-a.**





No	Action	Lead/ Other	Start	End	Cost	Progress
10i-a ▼	Investigate changes to flora and fauna of Slapton Ley through an agreed programme.  	FSC, EN Universities, Agency	01/12/98	31/03/03	u/k	Several surveys and studies are carried out, see text above.




No	Action	Lead/ Other	Start	End	Cost	Progress
10i-b ▼	Promote and support the establishment of a voluntary action group with input from statutory agencies to tackle recognised problems in the Ley through collaborative approach.  	EN, FSC, Agency, MAFF, FRCA, NFU, CLA	01/12/98	31/03/03	1k p.a.	The Agency attended the annual Slapton FSC Scientific and Land Management sub-committee meetings this year. A voluntary action group will be formed as part of the work we are leading in this area, including potential AMP3 improvements and our Heritage Lottery Fund bid.
10i-c ●	Establish/agree suitable habitat management to encourage the spread of strapwort around the Ley.  					Action completed at First Annual Review. Repair to Torcross weir will assist in providing habitat suitable for strapwort.

10j: Loss/deterioration of shingle bar habitats

Shingle bars have both biological and earth science importance. The shingle bank at Slapton is part of the National Nature Reserve and has been identified as an internationally important site. There are several unusual species which are adapted to the harsh conditions which prevail and a clear transition can be seen across the bar. Both the plants and the physical feature are vulnerable to damage by recreational activities. Shingle bars are also vulnerable to changes in sediment processes. The actions relating to this issue are addressed in Actions 3f and 3g.



10k: Threats to estuarine habitats

No	Action	Lead/ Other	Start	End	Cost	Progress
10k-a ▼	Promote and implement action plans for estuaries and associated habitats and species from Devon BAP.  	Agency, SHDC, Marine Conservation Officer, DWT, Landowners	01/12/98	31/03/03	2k	Draft management plan was produced for the Avon Estuary (May 2000) by the Marine Conservation Officer. The Salcombe & Kingsbridge Estuary Environmental Management Plan will be reviewed in 2001.
10k-b ▼	Support initiatives to enhance fringing habitats (grazing marsh, reed swamp) around Salcombe Kingsbridge Estuary.  	Agency, SHDC, Marine Conservation Officer	01/12/98	31/03/03	1k	Works have been carried out to increase the value of reed swamp at North Sands, Salcombe. West Charleton Marsh is now under conservation management and will benefit from the AMP3 improvement programme.

No	Action	Lead/ Other	Start	End	Cost	Progress
10k-c ▼	Investigate possibilities for water level management, particularly on grazing marshes alongside the Avon and Erme estuaries.  	Agency, EN, Landowners	01/04/99	31/03/01	u/k	Initial steps have been taken to identify key areas where water level management would benefit wildlife.
10k-d ▼	Support investigations to determine reasons for decline in number of swans on Salcombe Kingsbridge Estuary. 	Agency, Marine Conservation Officer	01/12/98	31/03/03	1k	Decline in the population appears to be due to natural causes. Autopsy of carcasses continues.

10l: Threats to key plant species






Two plant species occur in the catchment which are very localised in the UK and are considered to be vulnerable overall. Dwarf spike rush occurs in a few areas in tidal mud in the Avon Estuary while pennyroyal is found only in damp grassland around the Salcombe Kingsbridge Estuary. We will work with others to ensure that these species remain in their present sites and increase if possible. Heath lobelia, a plant of damp lowland heath, is threatened in Europe. Its largest regional population is found in the Avon catchment. Although the site is protected, there is a need for careful management to protect the population. Agricultural improvement outside the protected area is also a threat.

No	Action	Lead/ Other	Start	End	Cost	Progress
10l-a ▼	Contribute to local action plans to protect and encourage spread of dwarf spike rush and pennyroyal. 	Agency, SHDC, BSBI, Marine Conservation Officer	01/12/98	31/03/03	<1k	Conservation measures for dwarf spike rush are proposed in the forthcoming Avon EMP. Details of the pennyroyal site have been passed to English Nature.
10l-b ●	Manage site to maintain and if possible promote increase of heath lobelia colony. 	DWT, EN	01/12/98	31/03/03	u/k	New grazing management has led to a total of 12,7000 plants, the highest population recorded. Management is ongoing and therefore this action is complete.

Issue 11: Spread of Non-native Invasive Plants

Together with Plantlife and Pesticide Action Network, we are working nationally to raise the issue of invasive plants. Media interest is increasing, the issue was highlighted on the BBC Watchdog programme, and new legislation is anticipated shortly to aid regulation of invasive plants.

The management and control of estuarine and marine invasive species are proposed within the relevant Estuary Management Plans, and their introduction discouraged by Salcombe Kingsbridge Estuary codes-of-conduct and the proposed Local Nature Reserve Byelaws.

No	Action	Lead/ Other	Start	End	Cost	Progress
11a ▼	Record all occurrences of invasive species on sites owned or managed by the Agency and implement control programmes. 	Agency, SHCCS	01/12/98	31/03/03	3k p.a.	We continue to take measures to control invasive plants on sites owned or managed by the Agency. This is part of our routine work.
11b ▼	Collaborate with Japanese knotweed control programmes initiated by others. 	Agency, DNPA, SHDC, SHCCS	01/12/98	31/03/03	u/k	Further national leaflets are being developed by the Agency on the control, management and disposal of Japanese knotweed. Japanese knotweed by the Torcross shore at Slapton Ley was sprayed with Roundup in August 2000.
11c ▼	Encourage removal/control programmes for invasive plants (bankside and aquatic) to be carried out by riparian owners, pond owners and other interested bodies. 	Agency, SHCCS	01/12/98	31/03/03	<1k	Chemical control can be a useful option but use in or near water requires our consent. Agency staff are able to provide specialist advice.
11d ▼	Raise awareness among general public and distributors of problems associated with introduced aquatic plants, and discourage suppliers from making invasive species available. 	Agency, Garden Centre Trade Assoc, SHCCS	01/12/98	31/03/03	1k	Plantlife, the wildplant conservation charity, has produced, 'At war with aliens', proposing changes needed to protect native plants from invasive aquatic species.
11e ▼	Check ponds for presence of alien species as part of routine operations. 	Agency, SHCCS	01/12/98	31/03/03	1k	This is part of our routine ongoing work.

Issue 12: Recreational Use of the Catchment

We have a general duty to promote the use of inland and coastal waters for recreational purposes, and to take account of the needs of the less able. In carrying out this duty we 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 Countryside and Rights of Way Act 2000 will give the public a new right of access to mountain, moor, heath, down and registered common land. It also recognises the needs of landowners and managers. The Act also improves the rights of way legislation by encouraging the creation of new routes and clarifying uncertainties about what rights already exist.

Although a local code of practice exists for vessels approaching surface dwelling marine fauna, there are concerns over disturbance of marine mammals by pleasure craft off the South Devon coast and within its estuaries. Stephen Westcott, a regional authority on seals, has carried out research and made recommendations to reduce disturbance of grey seals at haul-out areas, commonly rocks where seals bask out of the water. Lindy Hingley, Brixham Seawatch, has made observations of bottlenose dolphins in the Salcombe Kingsbridge Estuary displaying avoidance behaviour of boats and showing signs of stress. Seaquest, a joint marine initiative between Devon and Cornwall Wildlife Trusts, are initiating a public debate on these issues. It is hoped that management and codes of practice can be introduced through Estuary Management Plans, see Issues 10 and 14.







The Dartmoor BAP, including the Freshwater Action Plan, encompasses issues relating to access and recreational use.












Research into the environmental effects of Irgarol 1051 (and other similar chemicals) is dependent on the outcome of the Health and Safety Executive's (HSE) review. A model is being developed which will provide estimates of these chemicals in estuaries. This model will help the regulatory process when the risk of antifouling products is assessed and conditions of use specified. In addition, the HSE, in conjunction with the Advisory Committee on Pesticides are reviewing chemicals approved for use in antifouling paints.

Action 12e.

Analytical methods have been developed for chemicals currently approved for use in antifouling paints and some monitoring has been undertaken as part of a national R&D project funded by the Agency and DETR. It was shown that diuron and Irgarol 1051 were consistently found at concentrations above the limit of detection, and that diuron was found in higher concentrations than Irgarol 1051. Results of <1-9.4 ng/l were found in UK estuaries and concentrations of 13-1420 ng/l in UK marinas. Progress on this action awaits the outcome of the Health and Safety Executive's review. **Action 12f.**

Bathing water is enjoyed by millions for recreation and its quality is one of the Government's indicators for measuring the quality of life. We continue to implement plans to reduce threats to the quality of our Bathing Waters. All fourteen designated sites in the catchment complied with the Directive's mandatory standards in 2000. In addition most of these sites were compliant with the more stringent guideline standards of the Directive (see Section 2.2). However, we will carry out data analysis on the failure of Thurlestone North Bathing Water to identify whether an investigation is required. **New Action 12j.**

No	Action	Lead/ Other	Start	End	Cost	Progress
12a	Work with others to develop sustainable recreation in the catchment which does not conflict with wildlife interests.  	Agency, Estuary Project, DNPA, SHCCS	01/12/98	31/03/03	1k	Guidance has been given to Sustrans, on the proposed National Cycle Network that runs through the South Hams. The Estuary Management Plan aims to balance the needs of wildlife, the environment and recreation.
12b	Take part, as a neutral party, in any discussions over access agreements for canoeists.  	Agency, DNPA, BCU, ROs	01/12/98	31/03/03	>1k	This forms part of our routine activities, however there has been no requirement for particular discussions to date.
12c	Carry out further investigation into causes of saltmarsh erosion in Avon Estuary.  	SHDC	01/12/98	31/03/03	u/k	This action is ongoing.

No	Action	Lead/ Other	Start	End	Cost	Progress
12d ●	Develop and encourage use of shore based disposal systems to reduce impact of sewage and litter from boats.  					Action completed at First Annual Review.
12e ■	Support research into the anti-fouling paint Irgarol and its environmental effects. 	Agency	01/12/98	31/03/03	u/k	We await the outcome of the Health and Safety Executive's review, see text above.
12f ■	Consider relevance of local and national studies on Irgarol 1051 to the Salcombe Kingsbridge Estuary. 	Agency, <i>Estuary Project</i>	01/04/99	31/03/00	1k	We await the outcome of the Health and Safety Executive's review, see text above.
12g ●	Provide advice on the disposal of boat scrapings.  					Action completed at First Annual Review. Advice was provided for the Salcombe Harbour Initiative.
12h ●	Support Salcombe Harbour Authority's initiative regarding the controlled collection of anti-fouling scrapings and contaminated materials.  					Action completed at First Annual Review. The SHA now have a controlled collection system in place.
12i ●	Draw up contingencies for the influx of visitors viewing the 1999 solar eclipse.  					Action completed at First Annual Review. No major incidents were reported during or after the Eclipse event.
New 12j x	Carry out data analysis to identify if an investigation is necessary at Thurlestone North Bathing Water. 	Agency	01/04/01	31/03/02	u/k	We will report on the progress of this new action in the Third Annual Review.



Issue 13: Lack of Information on the Archaeological/Historic Value of the Catchment

The catchment contains many sites of historic and archaeological value, the majority of which are found on Dartmoor. There are 148 Schedule Ancient Monuments within the catchment, and two Historic Parks and Gardens. Buildings and structures of county importance are protected under the Planning (Listed Buildings and Conservation Area) Act 1990. Thirty-one Built Conservation Areas have been declared in the catchment.

We have a duty to have regard to the protection and conservation of buildings, sites and objects of archaeological or historic interest when considering any proposals relating to our functions. Archaeological/historic features as yet unidentified are at risk from new developments or changes in land use.







The Historical Atlas of South West England has been published by the University of Exeter. The information in this book will help assess value in this catchment. **Action 13a:**

A Heritage Appraisal of a number of parishes is being carried out by Robert Waterhouse of South Hams District Council. Slapton is one of the parishes, and also transpires as being of importance as having evidence of 'reaves'. The discovery of these boundary structures in the lowlands, similar to those on Dartmoor, has helped rekindle interest in the archaeology of the South Hams. **Action 13a.**

No	Action	Lead/ Other	Start	End	Cost	Progress
13a ▼	Support production of document(s) covering entire area; investigate potential for collaboration.  	DCC, LAs, EH, DNPA, DAS, Agency, RCHME, UnEx, NT	01/12/98	31/03/03	u/k	The Historical Atlas of South West England has been published. A Heritage Appraisal of parishes is being carried out, see also text above.

Issue 14: Estuary Management Plans


The Salcombe Kingsbridge Estuary Environmental Management Plan²⁵ was produced in 1994 and is presently being reviewed. The draft management plan for the Avon Estuary¹⁴ was produced in May 2000 and the final action plan document will be produced in Spring 2001. The Erme Estuary Management Plan is at the first draft stage. The Marine Conservation Officer produces and manages all these plans and is based at the Harbour Offices in Salcombe. The Agency is represented on the Estuary Conservation Forum and has a close working relationship with the Marine Conservation Officer.

No	Action	Lead/ Other	Start	End	Cost	Progress
14a ▼	Continue to contribute to Salcombe Kingsbridge Estuary Conservation Forum.  	Agency	01/12/98	31/03/03	<1k	We continue to attend meetings.
14b ▼	Prepare an Estuary Management Plan for the Avon and Erme Estuaries in partnership with relevant organizations, landowners and estuary users in order to ensure and maintain the sustainable use of the estuaries.  	Agency, SHDC, DCC, EN, Duchy of Cornwall, Flete & Evans Estates, Users, Others	01/04/99	31/03/03	<1k	The draft Avon Estuary document was produced in May 2000. An inaugural Forum meeting took place in January 2001. The Erme Estuary Management Plan is being drafted.
14c ●	Consider financial support towards producing an Estuary Management Plan for the Avon and Erme Estuaries.  					Action completed at the First Annual Review. Financial support from the Agency was not available.

Issue 15: Unknown Causes of RQO Failure

There are two stretches where the cause of the RQO failure in 1999 is unknown: The South Grounds Stream from source to Slapton Ley inflow, and the Gara from source to Higher North Mill (see Section 2.1)

Following RQO failures of both watercourses in 1998 we recommended that the cause of the failures was investigated. No progress was made with this action as resources were concentrated on Bathing Waters investigations in 2000, because this was thought to be of a higher priority. We hope to be able to investigate the poor water quality in the South Grounds Stream this year. In addition, the work that the Agency has planned in the Slapton Ley catchment under the Heritage Lottery Fund bid may improve water quality in both these watercourses. **Action 15a.**

No	Action	Lead/ Other	Start	End	Cost	Progress
15a	Investigate causes of poor water quality in the River Gara and South Grounds Stream. 	Agency	01/04/00	01/04/02	u/k	No progress has been made with this action, see text above.

4 DUTIES, POWERS AND INTERESTS OF THE ENVIRONMENT AGENCY

The Environment Agency has a wide range of interests in the areas of water management, waste management and pollution prevention and control. Whilst many of these interests are supported by statutory duties and powers, much of the Agency's work is advisory, with the relevant powers resting with other bodies such as local planning authorities. The following table summarises the Agency's 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 powers) in:	Partnership
<p>Water Resources</p> <p>The Agency has a duty to conserve, redistribute, augment and secure the proper use of water resources.</p>	<ul style="list-style-type: none"> • Grant or vary water abstraction and impoundment licences on application with appropriate conditions imposed to safeguard the needs of the environment whilst allowing reasonable and justified use of available and sustainable water resources – with the aim of achieving an equitable balance between competing demands. • Revoke or vary existing licences to reinstate flows or levels to surface waters or groundwater which have become depleted as a result of abstraction. Compensation may be payable if such powers are used. • Secure the proper use of water resources through its role in water resources planning, and the assessment of reasonable need for abstractions and the promotion of more efficient use of water resources. • Monitor and enforce abstraction and impoundment licences. • Issue conservation notices to direct appropriate practices with regard to water resources 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. 	<ul style="list-style-type: none"> • The Agency uses its position as a statutory consultee to the planning authorities to secure conditions and agreements that protect the water environment and that encourage water conservation measures. • The Agency also seeks to influence planning decisions for new development by ensuring that planning authorities allow for any lead time required for resource development. • The Agency is committed to water-demand management and will work closely with water companies and developers, local authorities and relevant organizations 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.
<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 8 m of main river (Water Resources Act 1991, Section 109) or construction of a structure that would affect the flow of an ordinary watercourse (Land Drainage Act, 1991 Section 23). • 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 16 m 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.

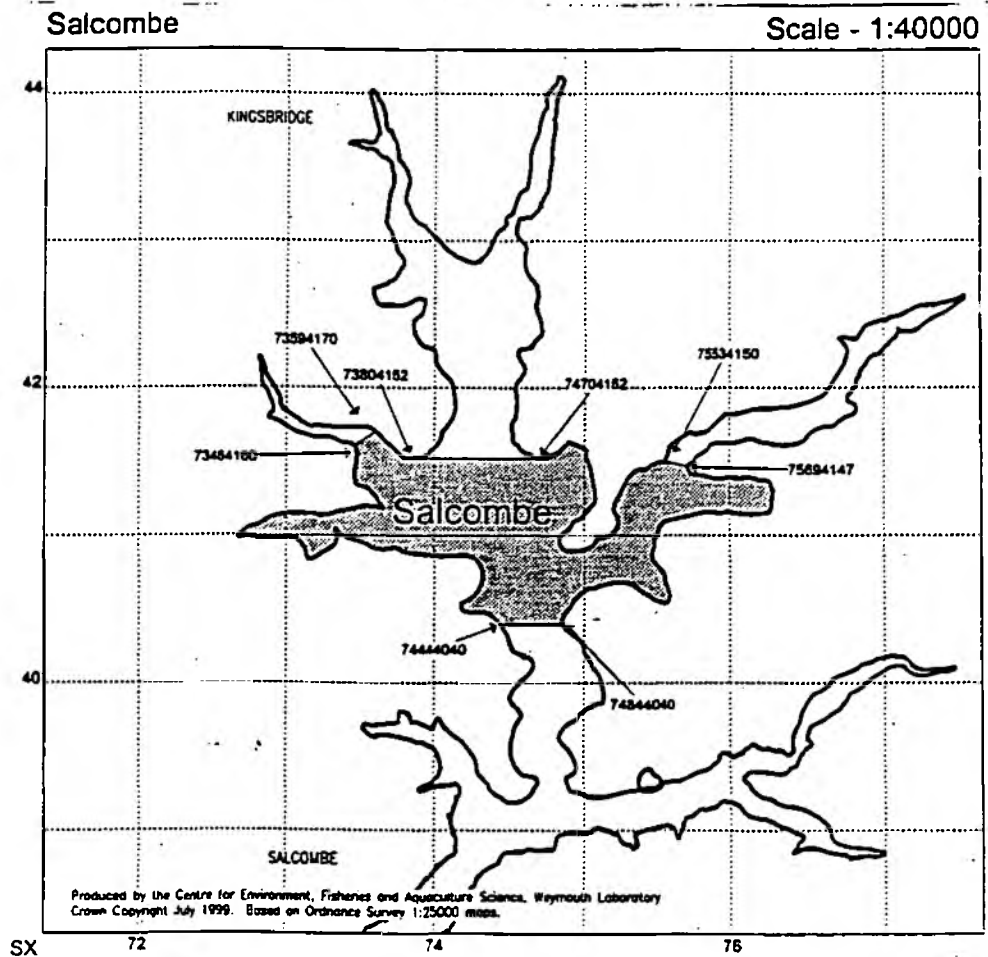
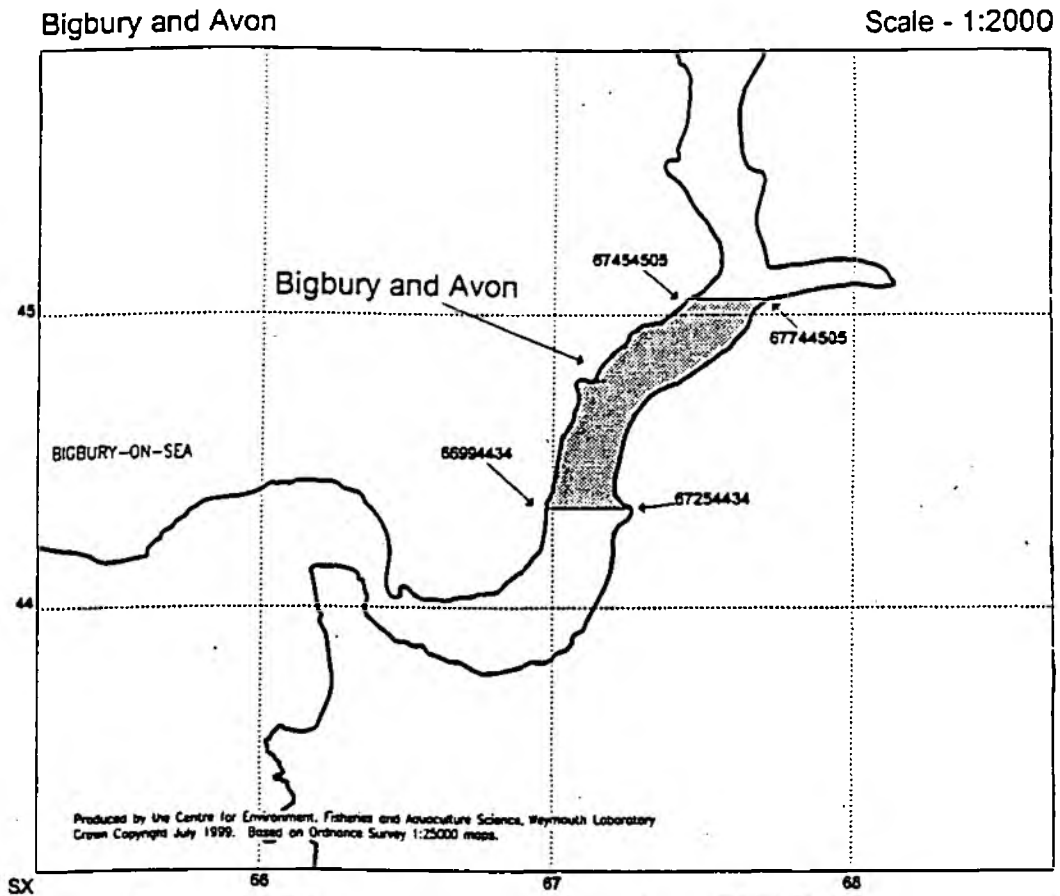
Agency Duty	The Agency has powers to:	The Agency has an interest (but no powers) in :	Partnership
<p>Water Quality</p> <p>The Agency has a duty to monitor, protect, manage and, where possible, enhance the quality of all controlled waters including rivers, groundwaters, lakes, canals, estuaries and coastal 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' and enforcement notices where action is required to reduce the risk of pollution. • Prosecute polluters and recover the costs associated with incidents. • 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.
<p>Air Quality</p> <p>The Agency has a duty to implement Part 1 of the Environmental Protection Act 1990.</p>	<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.
<p>Radioactive Substances</p> <p>The Agency has a duty under the Radioactive Substances Act 1993 to regulate the use of radioactive materials and the disposal of radioactive waste.</p>	<ul style="list-style-type: none"> • 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.

Agency Duty	The Agency has powers to:	The Agency has an interest (but no powers) in :	Partnership
<p>Waste Management</p> <p>The Agency has a duty to regulate the management of waste, including the treatment, storage, transport and disposal of controlled waste, to prevent pollution of the environment, harm to public health or detriment to local amenities.</p>	<ul style="list-style-type: none"> • 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. 	<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.
<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 we have taken responsibility as lead organization for 34 species and 5 habitats of wetland character. 	<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.

Agency Duty	The Agency has powers to:	The Agency has an interest (but no powers) in :	Partnership
<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 organizations which have direct control over archaeological and heritage issues to assist in the conservation and enhancement of these interests.
<p>Fisheries</p> <p>The Agency has a duty to maintain, improve and develop salmon, trout, freshwater and eel fisheries.</p>	<ul style="list-style-type: none"> • 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 entrapment 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.
<p>Recreation</p> <p>The Agency has a duty to promote rivers and water space for recreational use.</p>	<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. The Sports Council and other sport bodies carry this out. 	<ul style="list-style-type: none"> • The Agency will work with the Countryside Commission, the Sports Council, British Waterways and other recreational and amenity organizations to optimise recreational use of the water environment.

APPENDIX ONE

The Surface Waters (Shellfish) (Classification) Regulations 1997.



NB: Any land above the Mean High Water Mark, e.g., islands that falls within this area is excluded from the designation.

Glossary

abstraction - removal of water from surface or groundwater.

acidification - the detrimental effect of acid rain on soils and freshwater.

alien - plant or animal not native to the country concerned.

ammonia - a chemical found in water often as the result of discharge of sewage effluents. High levels of ammonia affect fisheries and abstractions for potable water supply.

Area of Outstanding Natural Beauty (AONB) - designated by the Countryside Commission under the National Parks and Access to the Countryside Act 1942, to conserve and enhance the natural beauty of the landscape, mainly through planning controls.

biodiversity - variety of wildlife and habitats.

buffer zone - strip of land, 10-100 m wide, alongside rivers which is removed from intensive agricultural use.

catchment - the total area from which a single river and its tributaries collect surface runoff.

controlled waste - defined by the Control of Pollution Act 1974, Part 1 section 30. It includes household, industrial and commercial waste.

Conservation Area - the Planning (Listed Buildings and Conservation Areas) Act 1990 imposes on local planning authorities a duty to designate as conservation areas any 'areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance'. Conservation Area status is the main mechanism available to effect conservation policies over a particular neighbourhood or area, as opposed to individual buildings. Designation introduces a general control over the demolition of unlisted buildings and provides the basis for policies designed to preserve or define an area's special architectural or historic interest.

controlled waters - defined by the Water Resources Act 1991 Part III section 104. They include groundwaters and inland waters, estuaries and coastal waters to three nautical miles from the shore.

critical load - the annual quantity of acidity, in hydrogen ion equivalents per hectare per year, which can be neutralized by soil or freshwater's natural buffering capacity.

dangerous substances - substances defined by the European Commission as in need of special control because of their toxicity, bioaccumulation and persistence. The substances are classified as List I or II according to the Dangerous Substances Directive.

demand management - activities to manage the amount of water required from a source of supply; includes measures to control waste and/or discourage use.

determinand - a general name for a characteristic aspect of water quality. Usually a feature which can be described numerically as a result of scientific measurement, e.g. pH, BOD, DO, etc.

diffuse pollution - pollution without a single point source, e.g. acid rain, pesticides, urban runoff, etc.

diversity - relates to the number of species present and their abundance.

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

eutrophication - the enrichment of water by nutrients, such as compounds of nitrogen or phosphorus. It causes an accelerated growth of algae and higher forms of plant life.

floodplain - parts of river valleys or coastal plains which are inundated during floods.

groundwater - water contained in the void spaces in pervious rocks and also within the soil.

habitat - natural home of plant or animal.

hydrology - the study of the interaction between rainfall, river flow and groundwater.

Integrated Pollution Control (IPC) - an approach to pollution control in the UK which takes account of potential effects upon all environmental media. Applies to prescribed processes and uses the principles of BATNEEC and BPEO.

Invertebrates - animals without a backbone, e.g. insects, worms and spiders.

landfill site - site used for waste disposal into/onto land.

Lichen - a group of lower plants consisting of a fungus which enfolds an alga, the two living together to their mutual benefit.

Local Nature Reserve (LNR) - nature reserves established, and usually managed, by District/Borough Councils. Local authorities are empowered to designate such sites under the National Parks and Access to the Countryside Act 1949.

Main River - designated under the Water Resources Act 1991 by the Ministry of Agriculture, Fisheries and Food. Formal consent is required for all activities that interfere with the bed or banks of the river or obstruct the flow.

mire - area of peatland; includes bog (acid) and fen (alkaline).

National Nature Reserve (NNR) - sites owned or leased and managed by English Nature and established as reserves under the National Parks and Access to the Countryside Act 1949.

outfall - the point where a river or pipe discharges.

permissive powers - powers which confer the right to do things but not the duty.

pH - a measure of the concentration of hydrogen ions in solution. Water with a pH less than 7 is acid and water with a pH of more than 7 is alkaline.

poaching - trampling by livestock causing land to break up into wet muddy patches.

reach - a length of channel.

restoration - the return to a pristine state.

Rhôs pasture - Rhôs is a Welsh word which means 'a wet, often heathy grazing pasture'. Nationally the word Rhôs has come to be used to describe this type of unimproved pasture, a characteristic mix of wet heath, rush pasture, fen meadow, mire and scrub. On the Culm Measure of north-west Devon and north-east Cornwall the habitat is known as Culm Grassland.

riparian - relating to or situated on the bank of a river or stream.

riparian owner - owner of land next to river; normally owns river bed 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 - water leaving a river catchment. Normally regarded as rainfall minus evapotranspiration (evaporation and loss of water by plants) but commonly used to mean rainwater flowing across the land (also known as overland flow).

septic tank - an underground tank used to treat sewage from properties without mains drainage. The sewage is settled and some bacterial treatment occurs. Discharge of effluent is usually to a soakaway system.

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.

Site of Special Scientific Interest (SSSI) - sites of national importance designated under the Wildlife and Countryside Act 1981 by English Nature in England. Sites may be designated to protect wildlife, geology or land forms.

sludge - the accumulation of solids from treatment processes.

smolt - young salmon migrating to sea for the first time.

soakaway - system for allowing water or effluent to soak into ground, commonly used in conjunction with septic tanks.

Special Area of Conservation (SAC) - areas designated under the EC Habitats Directive.

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.

wetlands - areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt.

Abbreviations and Units

Agency	Environment Agency
AMP	Asset Management Plan
AONB	Area of Outstanding Natural Beauty
BATNEEC	Best Available Technology Not Entailing Excessive Cost
BAP	Biodiversity Action Plan
BC	Butterfly Conservation
BCU	British Canoe Union
BDS	British Dragonfly Society
BPEO	Best Practicable Environmental Option
BOD	Biochemical Oxygen Demand
BSBI	Botanical Society of the British Isles
BTO	British Trust for Ornithology
CAMS	Catchment Abstraction Management Strategies
CEFAS	Centre for Environment Fisheries and Aquaculture Science
CLA	Country Landowners Association
DAS	Devon Archaeological Society
DBAP	Biodiversity and Earth Science Action Plan for Devon
DCC	Devon County Council
DETR	Department of the Environment, Transport and the Regions
DNPA	Dartmoor National Park Authority
DO	Dissolved Oxygen
DWT	Devon Wildlife Trust
EC	European Council
EH	English Heritage
EN	English Nature
ESA	Environmentally Sensitive Area
FA	Fishing Associations
FRCA	Farming and Rural Conservation Agency
FSC	Field Studies Council
FWMP	Farm Waste Management Plan
IPC	Integrated Pollution Control
ITE	Institute of Terrestrial Ecology
JNCC	Joint Nature Conservation Committee
LA	Local Authority
LEAP	Local Environment Agency Plan
MAFF	Ministry of Agriculture, Fisheries and Food
NERC	National Environmental Research Council
NFU	National Farmers Union
NT	National Trust
OFWAT	The water industry regulator
PAYBACK	Business environment association.
RCHME	Royal Commission on the Historical Monuments of England
RE	River Ecosystem
RO	Riparian Owners
RQO	River Quality Objective
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SHA	Salcombe Harbour Authority
SHCCS	South Hams Coast and Countryside Service
SHDC	South Hams District Council
SMP	Shoreline Management Plan

SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
STW	Sewage Treatment Works
SWW Ltd	South West Water Limited
TC	Torbay Council
TDC	Teignbridge District Council
UK	United Kingdom
U of Exeter	University of Exeter
UV	Ultraviolet
UWWTD	Urban Waste Water Treatment Directive
WDA	Waste Disposal Authority
WDBC	West Devon Borough Council

Units

°C	degrees centigrade
g	grams
ha	hectare
km	kilometres
km ²	square kilometres
l	litre
m	metre
m ³ /day	cubic metres per day
m ³ /s	cumecs: cubic metres per second
mg	milligrams
MI	megalitre
MI/d	megalitres per day
MI/yr	megalitres per year
mm	millimetre
MW	megawatts
ng/l	nanogram per litre
ppb	parts per billion
µg/m ³	micrograms per cubic metre
<	less than
≤	less than or equal to
>	greater than
≥	greater than or equal to
%	percentage

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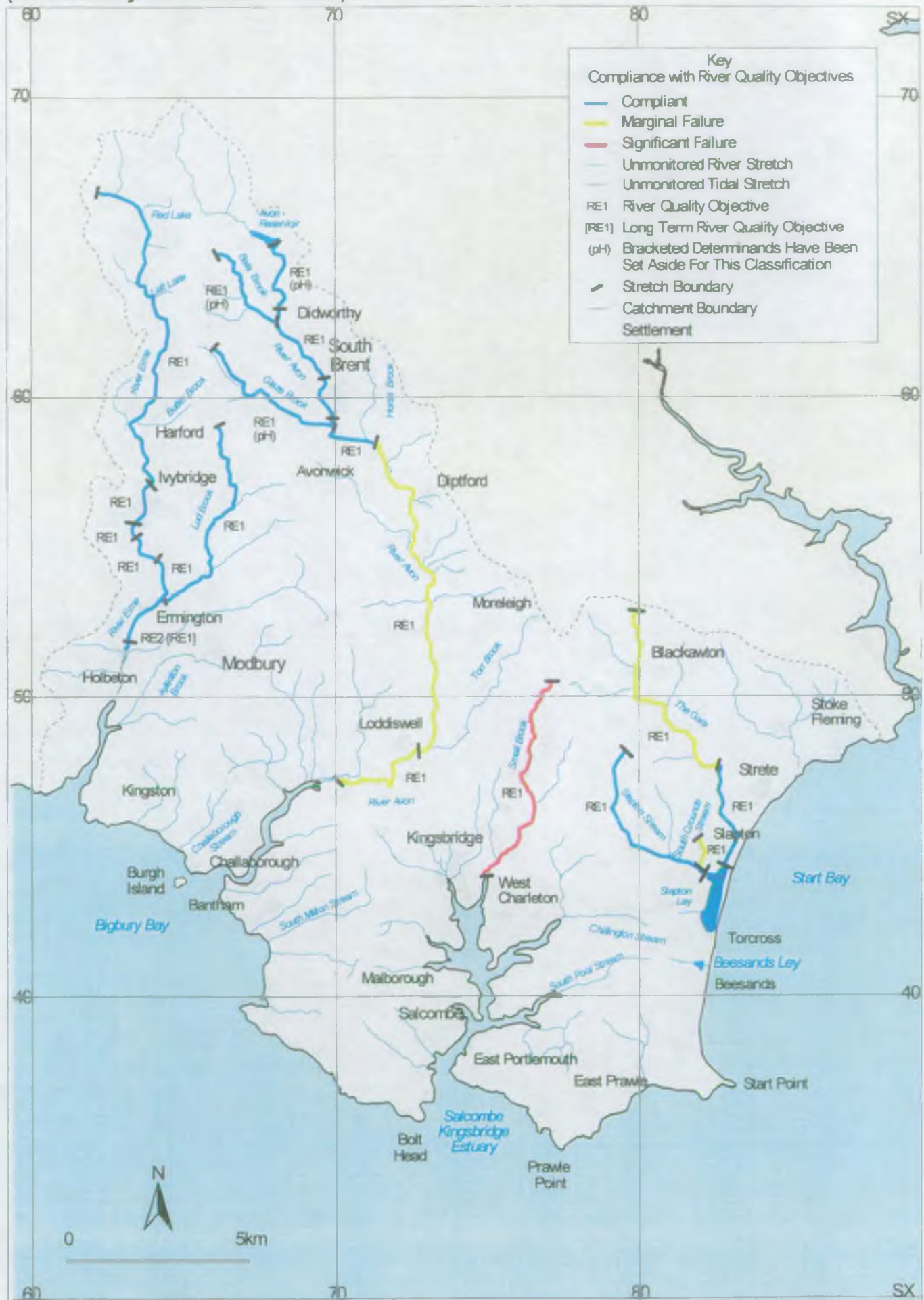
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Map 1 - Avon and Erme Catchment



Map 2 - 1999 Compliance with River Quality Objectives
(River Ecosystem Classification)



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