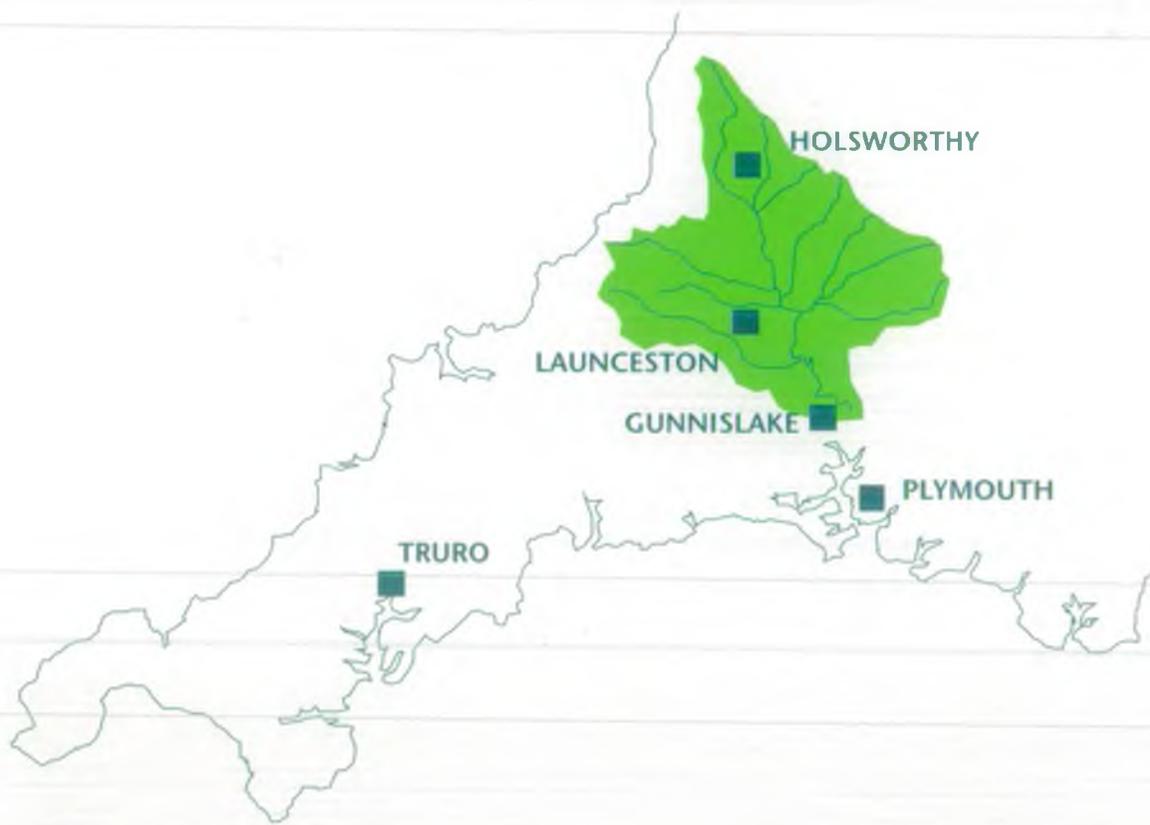




local environment agency plan

FRESHWATER TAMAR AND TRIBUTARIES

PLAN from JULY 1999 to JULY 2004



ENVIRONMENT
AGENCY

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Map 1 - Freshwater Tamar and Tributaries basemap



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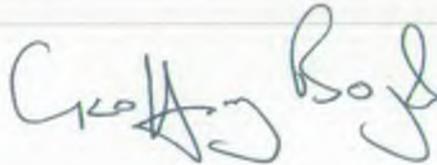


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Foreword

This Action Plan sets out the tasks that the Agency and others will carry out over the next five years. The actions address problems that arise from the pressures on the environment, and seek new opportunities to enhance it. Other solutions will be looked at in a longer-term perspective or a wider area. The effects of these issues on the area are also described.

We thank all who responded during the consultation period for this Action Plan. The spirit of partnership needed to implement this plan is represented by their valuable contributions, a spirit that will ensure that all who care for the environment can work together to enhance the whole.

A handwritten signature in black ink, appearing to read 'Geoff Boyd', written in a cursive style.

GEOFF BOYD
Cornwall Area Manager

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Introduction

The Environment Agency has a wide range of duties and powers relating to different aspects of environmental management. These duties, together with those areas where we have an interest, are described in more detail in Appendix 1. We are required and guided by Government to use these duties and powers in order to help achieve the objective of sustainable development. The Brundtland Commission defined sustainable development '*as development that meets the needs of the present without compromising the ability of future generations to meet their own needs*'.

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

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

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

Our aims:

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

We will do this by:

- Being open and consulting others about our work
- Basing our decisions around sound science and research
- Valuing and developing our employees
- Being efficient and businesslike in all we do

Our vision

Our vision is of this area being managed in a sustainable way, that balances the needs of all users with the needs of the environment. We look forward to a future where a healthy local economy leads to:

- biodiversity and the physical habitat for wildlife being enhanced
- people's enjoyment and appreciation of the environment continuing to grow
- pressures from human wants being satisfied sustainably.

We cannot realise this vision on our own and will seek to work in partnership with local authorities, local industry and local people to turn this vision into reality.

Environmental Standards

There is a great deal of legislation that determines the way we operate and carry out our enforcement duties. The Environment Act 1995 provides some harmonisation of powers, but we also rely on existing legislation, including the Control of Pollution Act 1974, the Control of Pollution (Amendment) Act 1989, the Environmental Protection Act 1990, the Radioactive Substances Act 1993, the Salmon and Freshwater Fisheries Act 1975, the Water Resources Act 1991, and the Land Drainage Act 1991.

We are the competent Authority for over 25 European Community environmental Directives, whilst a further 70 Directives affect our policies and activities. These include the Quality of Bathing Waters, Dangerous Substances, Industrial Plant Emissions, Waste Management Framework, Quality of Water to Protect Freshwater Fisheries, and the Urban Waste Water Treatment Directives.

Failure to comply with standards has helped us to identify the issues raised in this Plan. Further detail on standards and compliance is available from the address given on the back of this Plan.

Local Environment Agency Plans

We are committed to delivering environmental improvement at the local level and one of the ways to do this will be through Local Environment Agency Plans. These Plans will reflect our close contact with industry, the public and local government and will contribute towards achieving sustainable development.

The process of drawing up the plans will involve close consultation with all interested parties. It will promote the effective, accountable and integrated delivery of environmental improvement at the local level. The Plans will translate policy and strategy into delivery on the ground and will result in actions, either for the Agency to fulfil, or for others to undertake through influence and partnership. We believe the process will benefit the local community by influencing and advising external decision-makers and public opinion. It will build trust by being open and frank when dealing with all issues.

This Action Plan follows the production of the Freshwater Tamar Consultation Draft and the ending of the consultation period. The Action Plan will form the basis for improvements to the environment and primarily covers the period from July 1999 to April 2003. Achievements of the Action Plan will be monitored and reported annually. Future annual reviews will include new issues as they arise.

Environmental Themes

The Agency's principal and immediate environmental concerns stated in our national strategy 'An Environmental Strategy for the Millennium and Beyond' relate to nine themes. They are :

- Addressing climate change
- Improving air quality
- Managing our water resources
- Enhancing biodiversity
- Managing our freshwater fisheries
- Delivering integrated river-basin management
- Conserving the land
- Managing waste
- Regulating major industry

We will deliver this strategy at a local level by dialogue between ourselves and the various organisations involved in the protection and management of the environment.

The Steering Group

The Steering Group represents a range of commercial, local authority and environmental interests who endorse the Consultation Report and Action Plan prior to public release. They will monitor the implementation of the Action Plan and provide the Agency with specific advice on the importance of issues within the catchment. They act as a communication link between the local community, the Agency and its committees and will help to promote and develop initiatives of benefit to the environment within the catchment. The Catchment Steering Group will meet once a year during the life of this Plan. They are:

Name	Representing
Cllr N Burden	North Cornwall District Council
Mrs J Chappell	North Cornwall District Council
Mr G Dollard	Tamar and Tributaries Fisheries Association
Mr ER Gill	National Farmers Union
Ms MR Lane	Devon Wildlife Trust
Mr J Maguire	Ambrosia Creameries, Lifton
Mr R McCawley	South West Water
Mr B Muelaner	National Trust
Mr J Perry	Riparian Interests
Major JH Piper	Tamar and Tributaries Fisheries Association, Riparian Owner
Mr M Stanbury	Regional Flood Defence Committee
Mr RB Treleaven	Launceston Anglers
Mr A Vickery	Devon Waste Management Ltd
Mrs A Voss-Bark MBE	Area Environment Group, RFERAC, Tamar and Tributaries Fisheries Association
Mr P Winter	Torrige District Council

Review of the Consultation Process

Public Consultation – The issues listed in this Action Plan were identified in the Consultation Draft or resulted from the consultation process. The Freshwater Tamar and Tributaries LEAP Consultation Draft was launched on 15th December 1998. The consultation period closed on 18th March 1999. During this time the Consultation Report was promoted by:

- Radio, television and press reports
- Advertisements in local newspapers
- Displays at Launceston and Holsworthy libraries, with Agency staff available to answer questions on specified days
- The distribution of over 550 copies of the reports.

Results of Consultation and Further Action – A Statement on Consultation was produced in June 1999 and was distributed to all respondents. Copies are available on request from the address at the front of this plan.

Twenty-seven written responses were received, of which fourteen were questionnaire replies. The respondents included statutory organisations, industry, landowners, sport and recreation groups and the public (see Appendix 2).

Our vision for the catchment was shared or fully supported by a large number of organisations. All comments have been considered and, where appropriate, incorporated in the Action Plan. No additional issues have been added but many have been modified in response to the comments received and the negotiations, which followed the end of the consultation period.

Suggestions were received regarding the wording and the layout of the Consultation Report. Although we will not republish the report, we will use some of the ideas suggested in future publications.

We asked consultees to list what they felt were the most important issues highlighted in the Consultation Report. The responses indicated that the following were considered the most significant issues:

- Pollution prevention and contingency planning
- Effects of effluent discharges
- Looking after wildlife
- Meeting current and future water demand
- Decline in fish stocks

We list actions to tackle these issues, amongst others, in the Action Tables.

Overview

Characteristics:

- Strong contrasts between open, windswept moors with wide views and more sheltered landscapes of rolling, steeply undulating, open pasture separated by many small valleys.
- Heavy, poorly drained soil supporting rushy pastures of low agricultural quality but of high nature conservation interest; patches of heathland.
- At the edges of the two moors, Dartmoor and Bodmin Moor, lies a gentler landscape of small, irregular pasture fields cut by large, terraced, wooded valleys which shelter farmsteads and hamlets. The valleys have steep-sided, fast flowing streams and a network of sunken lanes.
- In the South the mining industry has made a strong impact on the landscape, with dramatically sited spoil heaps and ruins.
- Granite and slate used in cottages, farmhouses, villages, abandoned mine buildings and walls, unifies the landscape.
- Very high historic interest from the Neolithic period onwards: including highly visible features such as hut circles, standing stones, reaves, field systems, hillforts especially in upland areas.

The plan area is based on the river system of the freshwater Tamar and its tributaries draining from the Culm measures and the slopes of Dartmoor and Bodmin Moor to the tidal limit at Gunnislake. The total area covers 465 square kilometres.

The River Wolf catchment includes Roadford Reservoir, which supplies water to a large part of Devon and Cornwall. Rivers with dams have a modified flow regime. At times of low flows releases for abstraction downstream enhance water levels.

The area is essentially rural in character, ranging from Culm grassland, open moorland to rolling hills intersected by steep-sided river valleys. There is no heavy industry, but historically there was extensive mining activity, especially in the south of the area, which has left its own legacy of abandoned mines and workings.

Although Launceston and Holsworthy are sizeable market towns the rest of the resident population is scattered in small towns and villages and farms which gives rise to challenges and problems in providing services. An influx of summer visitors to the region changes the pattern of demand for the summer season. Infrastructure such as water supply, sewerage systems and waste management must be designed to cope with seasonal patterns of usage.

Recent and continuing research is showing that climate change is likely to change rainfall patterns in the future. It is expected that rainfall will be less frequent, but when it occurs, it will fall in larger quantities in a shorter time. Small but steep river catchments are extremely vulnerable to flash flooding at present and this change in rainfall patterns could exacerbate the situation.

We monitor 366 km of rivers in the Freshwater Tamar and Tributaries system. In 1997, 73.3 per cent of monitored river lengths in the area were of good or very good chemical quality, 21 per cent were of fairly good quality and 5.7 per cent were of fair quality. Although water quality has recently improved there are parts of the river system where it is not good enough. Actions to resolve these shortfalls in quality are discussed in this plan. The 1998 data will be available later this year.

Protection through Partnership

Working with others – The Agency is well placed to influence many of the activities affecting the environment, through the Environment Act 1995 and other legislation. Local authorities are responsible for controlling land use, and it is primarily land use change in the long term and the opportunities presented by redevelopment that will tackle the issues of urban runoff, contaminated land and the renewal of river corridors. In addition the support of community groups, individuals, landowners and businesses will be needed to tackle issues such as litter, pollution, private sector investment and river corridor enhancement.

The Agency must work with others to ensure that the actions in this Plan are implemented and that the long-term vision can be realised (Appendix 1 further describes our interests and opportunities for partnership). The Agency is working closely with local authorities in particular. Education also has an important role in changing attitudes and work practices.

There are a range of initiatives by various bodies which at some level affect the area of this Plan. These are both statutory and non-statutory in nature and cover a variety of topics from environmental to social and economic interests. A number of bodies have produced, or are producing, some form of documentation. It is important for all parties that where different interests overlap discussion occurs on those areas of common interest. In this way we can integrate action, being more efficient in our actions, avoiding duplication (or conflict) and making the most of limited budgets.

Local Agenda 21 – In 1994 the UK government produced a national sustainable development strategy and action plan for the UK. At the local level, most authorities are working with local communities to produce their own Local Agenda 21 (LA21) programmes, to promote sustainable development and to improve quality of life. The majority of district councils have LA21 officers in place. At the heart of the LA21 concept is the idea of “thinking globally, acting locally”. We welcome the opportunity to work with local authorities on Local Agenda 21 matters.

The Agency is keen to be seen as a source of locally based environmental information, and a promoter of environmental initiatives suitable for delivery through LA21 groups. These include initiatives such as “Use Water Wisely”, the Oil Care Campaign, and ideas to promote composting, also supported by County and District Council campaigns. We would welcome the opportunity to work with Local Agenda 21 groups to help deliver some of the actions listed in the activity tables.

In West Devon the Agenda 21 process is led by the West Devon Environmental Network, a community-based network created in 1992 which is now a charity. Extensive public consultation led to the formation of 16 principles, which are the basis for Agenda 21 in West Devon. Torridge Agenda 21 Environmental Forum, also a community-based network, created in 1998, lead Agenda 21 in Torridge District.

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.

Land Use Planning and Environment Planning – Land use is the single most important influence on the environment. It follows therefore, that land use change has important implications for the environment, which can be both

positive and negative. Government planning guidance highlights the importance of communication between local planning authorities (LPAs) and the Agency, and the relationship between land use and environmental matters.

The control of land use change is primarily the responsibility of LPAs, through implementation of the Town and Country Planning Acts. Local development plans provide a framework for land use change and are the key consideration in the determination of planning applications.

The Agency is a statutory consultee on development plans and certain categories of planning application. This allows the Agency's views to be considered by the council prior to a planning application being decided or policies in a development plan being approved.

The Agency has produced guidelines to local planning authorities on environmental policies and why they are important.

Biodiversity Action Plans – Conservation of habitats and species is co-ordinated through the production of county biodiversity initiatives. This process, which began at the Rio Earth Summit in 1992, enables us and other conservation bodies to prioritise and concentrate our efforts where they are most needed.

In Devon a steering group involving a large number of organisations involved in conservation produced 'The Nature of Devon: A Biodiversity Plan for Devon' in July 1998. The Cornwall Wildlife Trust (CWT), supported by the Agency and other groups, has produced Cornwall's Biodiversity Action plans in July 1998. Dartmoor National Park and English Nature have also produced 'The Nature of Dartmoor: A Biodiversity profile'. Short-listed habitats and species had their own action plans drawn up by expert focus groups, including the action plans for otter and for Dartmoor and Bodmin Moor.

LIFE Project – New development and agriculture is one of the major threats to semi-natural habitats and the species they support. The Cornwall Wildlife Trust, through the 'LIFE' project, is mapping the levels of change in such habitats, and what has replaced them. The Agency is one of a number of partners in this project.

Environmental Management Partnership schemes – Various schemes exist to encourage appropriate management of biologically rich habitat: Countryside Stewardship, administered by Ministry of Agriculture, Fisheries and Food (MAFF), various Sites of Special Scientific Interest (SSSI) Management Agreements including the Wildlife Enhancement agreed with English Nature. Positive advice on habitat issues by the Agency, Farming and Wildlife Advisory Group (FWAG), Wildlife Trusts and others helps to ensure conservation of this natural resource.

Dartmoor is an Environmentally Sensitive Area; this designation aims to protect and where possible restore, land character through the maintenance and adoption of compatible systems of farming. Payments are made to landowners by MAFF to manage land in an environmentally sensitive way.

The Uplands Bodmin Moor pilot project is an example of partnership working to preserve semi-natural habitat through environmental management. Schemes should target, as a priority, those areas and features noted as priorities in the Cornwall and Devon BAPs (see Table A, page 13).

Tamar AONB – The Tamar Valley Area of outstanding Beauty was designated in 1995 and consists of the estuaries and valleys of the Tamar, Lynher and Tavy. The Tamar Valley Countryside Service is currently formulating a management plan in consultation with statutory bodies, the local community and interest groups.

West Country Rivers Trust – The Agency is working in conjunction with the West Country Rivers Trust (WCRT) on the Tamar 2000 SUPPORT (Sustainable Practices project On the River Tamar). The Project is also partly funded by MAFF and the European Agricultural Guidance and Guarantee fund. The Trust works in partnership with the Agency, other regulatory bodies and the local farming community towards the aims of reducing erosion and the sedimentation of salmonid spawning gravel, reducing diffuse pollution and conserving and restoring wetland habitats.

Phase 1 of the project has been completed and the project is now moving into Phase 2 which builds upon the lessons learnt so far and refines the advice for land managers. This phase will require working very closely with all partners to disseminate best practice and training.

Waste minimisation promotions – The Agency liaises with the Cornwall Waste Management Forum, a partnership with the six District Councils and the County Council, and works in collaboration with the PAYBACK business environmental association in the set up of Waste Minimisation Groups. Through our regular contact with businesses we are advising firms on their environmental management systems including waste minimisation.

Clinical Waste Code of Practice - Sharps Disposal Project – A partnership between the Agency, Cornwall County Council, District Councils and the Cornwall and Isles of Scilly Health Authority has reviewed and re-issued the Code of Practice for disposal of clinical waste in the county. In response to concerns over the existing provision for disposal of needles and other sharps, this partnership has also initiated a free service for the disposal of these items.

Landfill Tax Credit Schemes – The Landfill Tax Credits Scheme allows funding for environmental projects to benefit the community using the revenue gained from the landfill tax. The schemes in both Devon and Cornwall to administer the Landfill Tax Credits are well established. The scheme in Cornwall is administered by the Cornwall Environment Trust, which distributes the credits from the County Environmental Services Ltd. Although the Agency does not sit on the Trustee board, we are supportive of a number of projects that have been funded by the schemes, for example in Devon a fishpass at Virginstow has been installed, partially funded by the scheme.

Cornwall Air Quality Forum – The Cornwall Air Quality Forum has been formed as one of 14 pilot areas nation-wide. It is led by Carrick District Council, and has representation from all local authorities in the county and the Agency. Management of air quality issues will be picked up in the work of the Cornwall Air Quality Forum. The forum co-ordinates the actions of regulatory bodies in Cornwall in regard to the National Air Quality Strategy. The local authorities are producing preliminary reports on air quality within their districts. These reports should be published by the end of 1999.

Air pollution may be in the form of gas or particulate matter. Its dispersion and dilution depends on the nature of pollution and climatic conditions. Its impact may be local, especially with regard to particulate matter which will often settle on nearby land or water, or it may be global, for example affecting the ozone layer or the concentrations of greenhouse gases such as carbon dioxide. It is vital that we protect the air since the future health of mankind and the environment depend on it.

We do not cover all aspects of air pollution but work closely with other regulatory bodies such as local authorities. Our duties and powers with regard to air quality are described in Appendix 1.

Actions

The following tables outline the actions needed to address the issues we identified in the Consultation Draft. The issues and activities are not presented in any order of priority.

The tables show the following information:

- Organisations which will implement the proposed activities, either in a lead role or as a key supporter.
- A timetable for the activity.
- An estimate of cost to the Agency over the next five years, where available. The initial 'U' means that no cost estimate is available at present.
- The financial years covered by this plan are represented by a single year, for example, '99' is the financial year April 1999 to March 2000.
- Those actions where we are not currently able to commit resources will remain empty.
- The man-days marked against actions is an indication of the trained resource that is likely to be required to fulfill the action.

In order for the Agency to make the best use of its available resources all work has to be prioritised. This may mean that lower priority work cannot be undertaken at a particular time. However, work identified in the plan can be reassessed should resources become available.

The following points should also be noted:

Our everyday work commits substantial resources to monitoring and managing the environment.

Some actions will require feasibility studies and cost-benefit appraisal of options prior to work commencing. In some cases, depending on the outcome of these studies, further action may not be justified. The Environment Agency and the participating organisations have limited resources and powers, and some work may take longer than indicated owing to funding availability, government policy and more urgent priorities.

Should more issues become apparent during the life of this Plan, further actions will be added at succeeding Annual Reviews.

Issue 1 Meeting current and future water demand

Water is an essential but finite resource that needs careful management to ensure its availability. The Agency has a duty under the 1991 Water Resources Act to conserve, redistribute, augment and secure the proper use of water resources in England and Wales. In fulfilling this role we must also carry out our general duties of environmental conservation and have regard to the statutory obligations of water companies to supply whilst expecting significant effort to manage demand. Management of water resources development is planned over long time-scales, up to 25 years ahead, to allow sufficient time to carry out necessary environmental studies and to ensure demand does not exceed supply. Further details of our duties and interests in water resources can be found in Appendix 1.

Various regional and national drought periods between 1989 and 1997 highlighted problems with water resources and supply in England and Wales. As a result, the Government put forward a plan to move the management of the water industry forward. This required water companies to undertake various actions and work and the Agency were asked to review the water abstraction licensing legislation. Government decisions following from this review were published by the Department of the Environment, Transport and the Regions (DETR) in March 1999 in 'Taking Water Responsibly'. However, the changes resulting from this will not be fully clear until the necessary changes in statute law are approved by Parliament.

Meeting Current Demand – The Freshwater Tamar catchment is part of the Roadford Strategic Supply Area (SSA) which is used to manage water supply in the majority of Devon as well as some of north-east Cornwall. The demand for water in the catchment is currently supplied from a number of sources dominated by the Roadford Strategic Reservoir but also including the Upper Tamar Lake. Public water supply resources in the area are managed by the Roadford SSA operating agreement.

Water supply demand forecasts up to 2021 for the individual SSAs were published in the National River Authority's water resources strategy document, 'Tomorrows Water'. This forecast does not indicate a deficit occurring in Roadford SSA until 2021, and then only under the 'high' scenario of demands. The amount of available water in the zone has been temporarily increased from the volume used in the Tomorrow's Water document due to the pumped storage licences in the SSA which the Agency supports as a prudent water resource development. These are time-limited licences, which allow SWW to abstract water from the rivers Lyd and Thrushel for transfer to Roadford reservoir until the year 2000. The licence operates between 1 January and 31 March and is controlled by prescribed flows on the respective rivers. The licence also requires SWW to undertake an environmental monitoring programme to allow the Agency to protect interests downstream and enhance the ecology of the watercourse.

In parallel with OFWAT's current third periodic review the Agency requires water companies to produce a Water Resources Plan for the next 25 years. This will include revised demand forecasts, a review of their resource availability and consideration of any potential resource options to meet forecasted deficits over the next 25 years. This information will enable us to revise the public water supply aspects of our Water Resources Strategy. SWW's plan was submitted to the Agency in March 1999 and a national review of all the plans is to be published later in the spring. We expect to publish our revised Regional Water Resources Strategy, covering all aspects of water resource use, during the year 2000, following the outcome of the third OFWAT periodic review by the end of 1999.

In March 1999, the Government agreed improvements in the environment that the Agency expected from the Third Periodic Review. The details were initially

published by the Agency in 'A Price Worth Paying' in May 1998 and subsequent Government guidance to OFWAT for the environmental and quality objectives was published in the report 'Raising the Quality' in September 1998.

Meeting future demand – The Agency requires the water companies to have satisfied us that they have applied a range of appropriate demand-management and resource-management options, as well as reducing leakage towards an acceptable level, before any further resources can be developed.

Demand management involves a number of different initiatives including metering. Meters are installed in all new domestic properties connected to the water company supply and customers currently have the option to have meters fitted at subsidised prices and those with garden sprinklers are asked to register with the company on the understanding that they may be metered later on. The company also offers a free leak detection service and a fixed cost supply pipe repair service.

The water companies have a duty to apply and demonstrate efficient use of water within the business and to its customers. SWW have published water efficiency plans containing strategies to deliver water saving by the customer. They include plans to deliver water savings by the customers in the home and garden and explain what the company is doing to encourage other bodies, such as local councils and builders, to help the customer to reduce water use.

More efficient management of existing resources can increase the quantity of water that is available. Both using sources in combination with one another and effective leakage control are key actions expected of the water companies. SWW have set a public target for leakage for the year 2000 equating to about 17 per cent of the water put into supply. They are currently on target to meet this reduction.

The Agency is a formal consultee on local authority structure plans. We assess the level of development and comment with respect to the available water resources in the area. We also comment on demand-management measures which can be incorporated within new housing developments: for example, low flush toilets, normal showers instead of power showers, normal-pressure hot water as opposed to mains-pressure (the latter has higher pressure and thus uses more water), low water-use dishwashers and washing machines and provision of water butts.

Non - public water supply abstractions – It is possible that there may be local environmental problems associated with full uptake of the few consumptive private abstractions in the catchment. The Agency will continue to monitor the net commitment to private water abstractions and have a regard to the amount of licensed volume take-up and its effects. Future abstraction needs will continue to be addressed through the abstraction licensing procedure.

Promotion of water-saving measures – The average family uses approximately 370 litres of water per day (135 cubic metres per year), and indications are that consumption will continue to grow. This suggests that there is a large potential for increasing water-saving measures. One area that has gained public prominence is the re-use of 'grey-water' which is household waste water excluding spent toilet water ('black-water'). The 'grey-water' can be recycled via the household plumbing system for use in toilet flushing or used out-of-doors for purposes such as garden watering.

Rainwater collected from roofs and recycled household waste wash water ('grey-water') can be used for toilet flushing or garden watering. It offers potential for large water savings but to encourage more rapid development and take-up of suitable systems there is a need for water quality standards to be established for this use.

The water companies have a duty to promote efficient use of water and the Agency expects that they should pursue this duty with imagination and vigour.

Operation of Roadford Reservoir – Roadford reservoir is operated in conjunction with other sources to meet the public water supply needs of North and South Devon and parts of Cornwall . The reservoir has a gross storage of 37,000 MI and under the current abstraction licences 81.5 MI/day (29,747.5 MI/year) can be taken to supply North Devon and 148 MI/day can be released into the river for abstraction downstream at Gunnislake. The impacts on flows in the River Wolf are mitigated by a 9MI/day compensation water release at all times from the reservoir. In addition flows are enhanced at times of low flow by the requirement for augmentation releases to be made to support abstraction at the Gunnislake intake. This is required when river flow falls below prescribed levels at particular points.

Effective use and conservation of these reservoir resources is achieved by operating them in accordance with a formal operating agreement between the Agency and SWW under Section 20 of the Water Resources Act 1991. This includes:

- Control curves based on reservoir storage to ensure conservation measures are brought in at key times.
- Measures to control releases to ensure they do not cause damage to the river environment downstream.

Roadford reservoir also has a fisheries water bank. The Agency consults with the Tamar and Tributaries Fisheries Association (TTFA) to decide how best to use this in the best interests of the fishery. As part of mitigation measures to compensate for the lack of salmon spawning on the River Wolf, SWW agree buy back measures annually with netsmen in the Tamar Estuary.

Actions	Tasks	Action By	Cost to Agency		Financial Year				
			(£)	Man days	99	00	01	02	03
Revise the Regional Water Resources Development Strategy including use of information received in the company's water resources plans.		Agency	U		●	●			
Agree programme of use of the fisheries water bank.		Agency SWW, TTFA	U						

Issue 2

Looking after wildlife

Biodiversity simply means variety of life. Within the plan area there is a range of habitats, wildlife and historic features of importance locally, at county level, nationally and internationally, many of which have some form of designation aimed at their protection. Conservation in its broad sense should be an integral part of all activities, and many of the issues and proposed actions within this document promote sustainable use of resources, or seek to make up for serious losses or impacts. A more targeted approach of specific conservation actions is being developed through the Devon Biodiversity Partnership and the Cornwall Local Biodiversity Initiative, and through English Nature's 'Natural Areas' Initiative.

It is our aim to promote sustainable use of, and development within, the area, allowing us to meet current needs without compromising the environment and the ability to meet our future needs. Key habitats and species have been identified for protection and Biodiversity Action Plans (BAPs) will provide a framework for our targets in nature conservation.

In today's landscape, rivers and wetlands provide refuge for many rare species. The conservation of the quality of rivers and wetlands is therefore vital in this catchment. Current initiatives to classify and describe the area, such as the Rivers and Wetlands Biodiversity Action Plan (R&W BAP), Dartmoor BAP, the Regional Biodiversity Initiative and Natural Area profiles will help us to prioritise our work, to encourage wise use of environmental resources and secure sustainable environmental improvements.

Within the plan area the key species and habitats which are particularly relevant to the activities in which the Agency has an involvement are shown in Table A. The table also shows major threats, where known. The table only gives an indication of the key nature conservation features of the plan area. For a full description of habitats and species the full BAP documents should be consulted.

Where possible, we will consider the effects on these species and habitats when authorising our consents and licences.

By analysis of the digitised land cover data, as well as the more traditional monitoring techniques such as carrying out field surveys, the causes of habitat and species loss can be assessed.

The extent of loss or degradation of habitats between 1988 and 1995 varies between habitat types. Analysis of Cornwall has shown that wetland habitat has suffered the greatest loss of all, county-wide, with a decrease of over 7 per cent during the study period, compared with a loss of 3 per cent over the last decade for all habitat types. In addition to total loss, habitat quality has become degraded through neglect and fragmentation into smaller blocks.

It is widely believed that by looking after habitat its component species will be safeguarded also. This is true to a degree, but there are some species that need specific help too. An example is the otter which has returned to the area in significant numbers, following their major decline in the 1960s and 1970s. Otters have a relatively large territory and cannot be effectively conserved just by protecting a few sites. Measures, such as ensuring that acceptable water quality is achieved, and carrying out works at specific locations to prevent road kills, need to be put in place also. The otter is the subject of its own Species Action Plan. We have helped fund Wildlife Trust otter project officers in Devon and Cornwall who will promote otter conservation throughout the counties.

We will carry out surveys every three years on the River Tamar and its tributaries for salmonid fish and key species including otters, water voles and key non-salmonid fish.

Table A: Key habitats and species

Key habitats	Species	Status	Threats
Boundary features e.g. Cornish hedges, ditches	Plants - ferns, lichens & mosses, Small mammals - dormouse Reptiles - common lizard	National priority	Removal, neglect, poor management
Culm Grassland e.g. Dunsdon Farm National Reserve	Insects - marsh fritillary, Plants - whorled caraway, wavy leafed St Johns wort, bryophytes Birds - barn owl, curlew	Nationally and locally important	Drainage, waste spreading, tipping, pond creation, neglect, ploughing
Freshwater Rivers/streams, ponds, watercourses, floodplains and fluvial processes	Mammals - otters, water voles Fish - salmon, bullheads, native brown trout, sea trout, lamprey, grayling Mollusc - freshwater mussel Plants - Cornish moneywort, lower plants Birds - dipper, kingfisher, sand martin Insects - dragonflies including Southern damselfly	Nationally and locally important	Nutrient enrichment from fertiliser runoff and sediment release from bank erosion, changes in land use, runoff, water abstraction
North Dartmoor Upland heathland, valley mire	Blanket bog, lower plants, invertebrates	Internationally important	Inappropriate grazing and burning regimes drying out of moorland/blanket bog acid deposition
Bodmin Moor	Typical moorland species including golden plover	Nationally important	Recreation, stocking levels

Water voles have declined nationally. Their status in this area is uncertain, but there appear to be areas of suitable habitat, or areas where such habitat might be improved. Plans for this species are well developed both locally and nationally and we will adopt the recommendations when they have been completed.

Riparian birds such as sand martins and kingfishers have high popular appeal; they are vulnerable to loss of nest sites as a result of erosion control works to rivers, as well as adverse conditions either here or in wintering areas. Concern has been expressed at changes in the population and we need to monitor this with the help of other organisations. We will ensure all known nest sites are protected during our own work or when authorising the actions of others.

Culm grassland – Culm grassland is a wet grassland habitat rich in rare species of flora and fauna including the marsh fritillary butterfly, which is a key species identified in Biodiversity Action Plans. Culm is found only in North Cornwall and North Devon and has become scarcer as farmland has been drained and otherwise used more intensively. An inventory of Culm grassland has been completed for the Culm Measures Biodiversity Action Plan. It identifies and lists the total remaining area of this habitat. The majority of the remaining area is currently protected through environmental management schemes.

Wetland habitats can be recreated and can form a thriving community of wildlife within a few years. In conjunction with our partners in the county Biodiversity Initiatives we are supportive of planned study to identify sites where Culm recreation could be successful. We are currently evaluating the need and timing of a training day for planners and developers on the potential of inclusion of wetland habitats in new developments.

We work in partnership with organisations such as English Nature and FWAG to advise landowners on management of important Culm areas.

River Habitat Survey (RHS) – Organisations such as the Agency, which are involved in the protection and management of water, need to characterise and classify the physical structure of rivers to operate effectively. The results of surveys can then be used to provide river managers with information needed to sustain and enhance biodiversity, monitor changes in rivers, and for background information in such processes as environmental impact assessments.

The quality of river habitat at a site is assessed by comparison with other similar sites, using criteria derived from known conservation value and from the occurrence of special features (rare features can improve quality). It is based on physical river channel and corridor features that are known to be of value to wildlife, and improves with the 'diversity' and 'naturalness' of the physical structure. Comparisons can be made with 'pristine' benchmark sites of known conservation value to plants and animals.

Two scores are assigned to each site, Habitat Quality Assessment (HQA) score and Habitat Modification Score (HMS). The HQA score increases with the optimum proportions of positive habitat features and the HMS score increases with increasing proportions of modification features. The overall site quality is based on the HQA and HMS scores, its common 'pristine' channel characteristics, its features of local importance, and its importance as a river type (upland/lowland stream etc.). A final assessment of site quality can then be reached and its level of conservation importance appreciated.

Results from the national baseline survey indicate that the area has a Habitat Modification Score of 2 which falls within the 'semi-natural' category. Poaching of riverbanks by livestock through inappropriate management appears to be a significant issue; poaching occurred in 53 per cent of the sites. There are a number of projects that aim to reduce this problem (TAMAR 2000, Fisheries fencing projects, Bodmin Moor Project, Countryside Stewardship Schemes etc). An additional 30 sites were surveyed in 1997/98 and the information obtained will help to clarify problems and outline possible actions.

The Habitat Quality Score (HQA) is a broad measure of the physical habitat structure of the site and includes channel and river corridor features that are of known wildlife interest such as exposed tree roots as potential otter holt sites and broad-leaved woodland. The LEAP area scored a HQA of 53 which is an average score when compared to similar river types in the national baseline survey.

More information about River Habitat Survey, the national baseline survey and how it can be used is available in the Environment Agency publication 'River Habitat Quality – the physical character of rivers and streams in the UK and Isle of Man' Report no.2 1998.

Partnership schemes – Schemes exist to encourage appropriate management of biologically rich habitat. Countryside Stewardship, administered by MAFF, various SSSI Management Agreements agreed with English Nature, as well as positive advice on habitat issues by the Agency, FWAG, CWT and others help to ensure conservation of this natural resource.

The Uplands Bodmin Moor pilot project is an example of partnership with one of its aims being working to preserve semi-natural habitat through appropriate management. Schemes should target, as a priority, those areas and features noted as priorities in the Cornwall BAP (see Table A).

Invasive plants – As a result of the Japanese knotweed conference on 25th November 1997, organised by the Agency and hosted by the National Trust, a co-ordinated control policy for Japanese knotweed is being developed to try to prevent its further spread and to control its growth in those areas where it currently exists. Representatives from County and District councils, the Agency, the National Trust, Cornwall Wildlife Trust, SWW, English China Clays

International (ECCI) and many more were present at the conference. Our flood defence maintenance teams are seeking to adopt the best practice for the control of Japanese knotweed developed by the group.

We have sponsored a countywide survey of Japanese knotweed which is being compiled by the Botanical Society of the British Isles, and will be available in a Geographical Information System format. Recording forms have been sent in by many local people. A leaflet explaining how to prevent the spread of Japanese Knotweed and a recording sheet is available from this office.

Surveys of invasive plant species will also be conducted in the three-yearly summer survey programme - this will help when considering maintenance proposals.

Giant hogweed has now established itself along parts of the River Tamar. We are currently seeking funding to carry out an eradication project. A booklet giving advice on the control of this species is available from Agency offices.

Actions	Tasks	Action By	Cost to Agency		Financial Year				
			(£)	Man days	99	00	01	02	03
Implement Biodiversity Action Plan	Biodiversity Action Plan for Devon and Cornwall launched in 1998. Dartmoor BAP is in progress. Note: specific actions can be found throughout this Action Plan.	Agency/ All partners	U	U	●	●	●	●	●
Management of Culm grassland	Produce management guidance on Culm grassland including species such as marsh fritillary	CWT, DWT, Agency	U		●				
	Regular monitoring of key sites	CWT, DWT	U		●	●	●	●	●
	Map extent of existing Culm grassland and identify sites for restoration	Agency DWT, CWT	U		●				
	Provide advice on the management of watercourses to protect wetland including Culm	Agency	U		●	●	●	●	●
Recreate wetland habitat (including reedbeds) where appropriate	Identify potential small sites (<20ha)	Agency/BAP partners	U						
	Organise training day for planners/developers on potential of wetland habitats.	Agency/BAP others	U						
Carry out River Habitat Survey.	Continue to survey the rivers to assist in the management and enhancement of the area.	Agency	U	U	●	●	●	●	●
	Identify sites and carry out stream habitat improvements from RHS	Agency	20k		●	●			
Promote eradication of invasive plants species	Carry out trials on eradication of Japanese knotweed and other recommendations of the knotweed group	Agency/ others	U		●				
	Eradication of giant hogweed from watercourses								

Issue 3 Decline in fish stocks

Natural fisheries are important ecological assets and are also of commercial value for angling and netting. Fish are good indicators of the overall health of our rivers. We use information from our routine population surveys and fishing catch returns to assess the diversity and health of fish populations. We are currently involved in implementing a classification scheme following a research and development project which will enable us to set targets for the river system and also to put the fisheries into a national context. Our duties and powers with regard to fisheries are described in Appendix 1.

National decline in salmon stocks – An assessment of fish stocks carried out by the Agency revealed that salmon catches in England and Wales in 1997 were amongst the worst on record, with the overall level of spawning below that needed to maintain healthy sustainable salmon fisheries.

The Agency is already undertaking action to protect and conserve salmon stocks through the implementation of its national Salmon Management Strategy. Under this strategy, action plans are being produced for every main salmon river in England and Wales and the entire programme will be completed by 2002. Working with other interested organisations, the Agency is taking steps to improve river habitats and water quality, whilst introducing additional controls on fishing and promoting 'catch and release' schemes where these are needed.

New measures, which include restrictions on fishing effort for part of the season, have been discussed in response to independent scientific advice on the state of salmon stocks internationally, given to the North Atlantic Salmon Conservation Association (NASCO) recently. This emphasised the decline in stocks throughout European waters, believed to be linked to changes in oceanic climate, which is putting some salmon populations at risk.

Particular concern was expressed about stocks of multi-sea winter spring salmon (the older, larger salmon, which tend to return to rivers from the sea earlier in the year). It was therefore recommended that immediate action be taken to reduce exploitation. As a result, the contracting parties to NASCO, including the EU, not only reduced the quotas in the Greenland and Faroes sea fisheries, but also agreed to examine further measures to protect stocks in their home waters. The Agency has sought the views of its Regional Fisheries, Ecology and Recreation Advisory Committees (RFERACs) on the need for baseline national action, and the type of measures that should be introduced across England and Wales. Following MAFF's public consultation, the Minister confirmed the byelaws to take effect on 15 April 1999.

In brief, the confirmed national byelaws are as follows:

- Delay in the salmon and sea trout netting season to 1 June; a few specified fisheries (listed below*) may still net for sea trout before this date though any salmon caught must be returned immediately with the least possible injury.
- Any angler catching a salmon before 16 June must return it with minimum injury.
- Angling for salmon before 16 June can only be with artificial fly or artificial lure (N.B. existing more stringent local regulations will remain in force, such as fly only at certain times on several rivers including the Usk, Wye, Taw, Torridge, Hants Avon and Dee.)

*Seine net fisheries on the rivers Dart, Teign, Towy, Nevern, Teifi, Fowey and Dovey;
 Coracle fisheries on the rivers Towy, Teifi and Taf;
 Net fisheries in the Anglian Region; T and J net fisheries in the North East Region.

While we agree there is a national decline we are concerned that factors specific to the River Tamar are having a significant effect on salmon populations. These factors were assessed recently in a Salmon Action plan for the River Tamar which identified that there is still a great deal of investigative work that needs to be carried out by the Agency and other interested parties.

Natural predation – Natural predation by birds and mammals occurs throughout the fishery. At present it is not known if this is having a significant impact on fish stocks. Licences to kill predators are issued by MAFF once a fishery owner proves economic impact. We work with fisheries owners and MAFF to advise on preventative measures. We will not support the licensed killing of predators unless and until proof of serious commercial damage has been established and that such killing is proven to be the most effective means for preventing significant loss to fish stocks.

Introduction of non-native species – Within the plan area there are lakes containing a variety of fish species not found within the river system. We are concerned about the occurrence and impact of fish escapees on native species. Serious diseases can be spread to wild populations through the introduction of non-native species and predation by alien species can cause damage to the existing fishery. We are currently running a leaflet campaign giving advice on the 'dos and don'ts' of stocking. We are also concerned about the potential impact of trout stocking on local fishery populations.

Poaching – Rigorous and high profile enforcement within the rivers, estuaries and coast needs to be maintained by the Environment Agency, MAFF and Devon Sea Fisheries Committee (DSFC). The Agency endeavours to respond quickly to all reports of poaching but funding for this type of enforcement has been reduced in recent years. Therefore the Agency increasingly relies on information from other bodies and the general public to alert us quickly to poaching incidents. We can then target resources effectively to combat the problem.

Tamar Lakes – See Issue 4 for discussion on the effects of the Tamar Lakes on the upper Tamar system including the fishery.

Changes in populations of brown trout – There has been concern expressed over a perceived lack of brown trout in the Rivers Ottery and Lyd. The Agency is currently producing a trout strategy, which will assist in the management of these stocks.

Instream structures – The Agency is currently working with South West Rivers Association (SWRA) on a joint protocol to achieve appropriate siting of these structures. Whilst benefiting the river by creating deep-water habitats, instream structures may cause flooding, erosion, and prevent spawning, if placed in inappropriate locations. We are at present preparing a guidance policy for best practice for the removal of trash dams and other obstructions; however identification and removal of serious obstructions is ongoing.

Actions	Tasks	Action By	Cost to Agency		Financial Year					
			(£)	Man days	99	00	01	02	03	
Maximise habitats including: reducing silt inputs fencing project cleaning of spawning gravels assessing effectiveness of gravel rehabilitation.		Agency, WCRT, Riparian owners	U		●	●				
Refine targets level for salmonid fishery population recommended in Salmon Action plan.		Agency	U			●	●			
Investigate effects of stocking trout on native salmonids through an Agency Research & Development project.		Agency								
Prepare a best practice protocol for positioning of in- stream structures.		Agency, SWRA	U		●					
Investigate causes of low juvenile populations where they exist. This will include assessing the effects of water quality, water resources and predation.		Agency	U							
Maximise use of resources to prevent poaching including collaborative work with other parties		Agency / riparian owners, TTFA, general public	U		●	●	●	●	●	
Appropriate removal of trash dams / instream obstructions		Agency/ WRCT, riparian owners								
Promote the 'Buyer Beware' principle for fish stocking		Agency	U		●					

The two Tamar Lakes lie near the head of the River Tamar and therefore have influence over much of the upper part of the river system. There are a number of interconnecting issues relevant to the management of the Lakes, which are best resolved in conjunction with each other, and with the involvement of all interested parties.

Investigating concerns over low flows – We will be investigating the historic and current flow regimes relating to the use of the Tamar Lakes with a view to clarifying the impact of the lakes on the downstream flow of the Tamar. The influence of flows from the Lamberal Water will also be investigated.

This work will clarify the impact of the Upper and Lower Tamar Lakes on the downstream volumetric flow of the River Tamar. The investigation will consider the effects of the existing abstraction licence conditions for Upper Tamar Lake, the influence of flows from Lamberal Water and the retention of flows within Lower Tamar Lake. In addition the investigation will consider the changing role of the Lower Tamar Lake as an amenity feature and the current study into the restoration of the Bude Canal which is being led by North Cornwall District Council.

Land drainage can exacerbate low flows in rivers because it removes water, which would normally soak into the ground and consequently make up the baseflow of watercourses in times of lower rainfall. The use of buffer zones and source control in appropriate locations can aid the infiltration of groundwater and can improve water quality.

Effects of algae blooms – Blue-green algae blooms have been reported in Upper Tamar Lake over the past few years, although the problem has been ongoing since the 1970s. During the summer of 1995 a severe bloom of the blue-green algae *Aphanizomenon flos-aquae* in the lakes spread downstream into the river system where it continued to proliferate. Failures of the EC Freshwater Fish Directive in previous years in both the Upper and Lower Tamar Lakes are linked to these algal blooms. These failures occurred because of high pH, which was a result of photosynthesising algal blooms.

During 1997 the Agency carried out a biological study of the Upper Tamar Lake and the surrounding catchment to try to gain an understanding of the trophic and ecological status of the lake. The conclusions of this study were that the extent of the eutrophication within Upper Tamar Lake is likely to be having a deleterious effect on the river downstream of the impoundment. The study recommended continued monitoring to determine the sources of nutrient enrichment, to consider methods of reservoir management and to make relevant Environmental Health authorities aware of possible health risks from recreation on the Upper Tamar Lake at times of algae blooms. In 1998 biological and chemical investigations continued within both the lakes. These investigations are continuing throughout 1999.

Water quality compliance – The River Tamar from its source to the Upper Tamar Lake was non-compliant for Total Ammonia in 1997. (See Appendix 2). Agriculture is likely to be a contributory factor and pollution prevention works are being carried out. The River Tamar from the Lower Tamar Lake outflow to Polson Bridge was non-compliant for biochemical oxygen demand (BOD). Non-compliance with River Quality Objectives (RQOs) in this stretch may be linked to effects of algal blooms moving downstream from the Tamar Lakes.

We are working in partnership with SWW to pursue a number of actions to minimise the effects of algae blooms in the Tamar Lakes.

Actions	Tasks	Action By	Cost to Agency		Financial Year					
			(£)	Man days	99	00	01	02	03	
Investigate low flow concerns	Carry out investigation and make recommendations on appropriate future actions	Agency	U	15	●					
Support the use of buffer zones and source control in appropriate locations		WCRT, Agency, landowners								
Investigate sources of nutrients to Tamar Lakes	Ongoing monitoring and farm visits to pinpoint sources	Agency	U		■	●				
Carry out monitoring throughout the catchment to identify effects attributable to algae.		WCRT, Agency	Core							
Encourage reduction of nutrient inputs throughout catchment	Ongoing farm visits	Agency / landowners / SWW	U							
Identify best environmental options to minimise effects of algae blooms	Identify best environmental options to minimise effects of algae blooms	Agency / SWW	U		●					
	Identify polluting sources and influence farmers in the best management of dealing with farm waste in the lake catchment.	Agency	U							
	Identify best environmental options for managing the Lake.	SWW	U		■	●				

Issue 5 Pollution prevention and contingency planning

Prevention is better than cure – The Agency and its predecessor organisations have always been closely involved in pollution prevention and education. The Agency reaffirms its commitment to pollution prevention and working, in conjunction with industry and the public, to minimise or eliminate pollution at source. The aim is that, through the provision of practical advice and guidance, the promotion of advisory literature, regular inspection and promotional talks or seminars, the Agency does not only act in a regulatory role.

Eclipse 1999 – The County Councils in Cornwall and Devon anticipate that there will be a large number of additional visitors to Cornwall and South Devon to see the solar eclipse on 11 August 1999. While the duration of the eclipse is only a few minutes, there may be a significant number of additional visitors for the three-week period (31 July to 21 August), who are planning to see the eclipse as part of a longer holiday.

The two counties have established a steering group, and a number of working groups, to allow representatives from the emergency services, statutory bodies including the Environment Agency, utilities and the tourist industry to plan for the Eclipse.

The Agency recognises that additional visitors represent an economic opportunity for the region, but we are also concerned that such an increase in population poses a real threat to the environment. This is in terms of both managing and disposing of waste appropriately, and the threat posed by possible over abstraction of private water supplies to augment mains water supplies and the use of unlicensed sources. Following the floods of Easter 1998 in the Midlands and Wales we are also very concerned about the safety of people on campsites close to watercourses, which may be at risk of flooding.

Our primary duties are to use our statutory powers to protect the environment, and to protect people and properties from flooding. We are planning to use our regulatory powers to secure these objectives for the time period of and around the eclipse.

We have adopted this approach for the following reasons:

- Without careful management, there is potential for environment damage to occur both during the Eclipse period and in the longer term;
- The environment of Cornwall is extremely important to the economy of Cornwall, both to the rural economy and the tourist industry; for example bathing waters and fisheries must not be affected by discharges failing consent standards, or illegal discharges;
- The interests of existing water users, whose livelihoods or health may be affected, must be secured; for example, by ensuring that there is sufficient water supply for livestock watering; and by ensuring the protection of the quality of private water supplies;
- The unique ecology of Cornwall must be protected, including sites, which have statutory designation.
- The safety of people in flood risk areas should not be compromised.

Guidance has been produced and distributed to all parties who have made enquiries regarding the requirements for water and waste management and flood risk issues at eclipse sites. The Agency will continue to work closely with relevant organisations and event organisers to protect the environment, and to protect people from flood risk.

Year 2000 - The Millenium Bug – It is possible that, as the year 2000 begins, computer driven systems within industry such as automated production or treatment systems, automatic flow or monitoring equipment will fail to recognise the date and cause system failure. The potential for environmental impact caused by such mass failure of systems is considerable. For this reason the Agency has sent letters to all of its customers who hold consents / authorisations, and others we believe to be at risk, to inform them of the potential problems associated with the year 2000 and computer operated systems. The failures could affect farm waste systems, sewage treatment systems or other industrial processes. The exercise is intended to give adequate warning for operators to ensure that their system is not at threat from the year 2000. Any breach will be considered in line with our enforcement policy.

Actions	Tasks	Action By	Cost to Agency		Financial Year				
			(£)	Man days	99	00	01	02	03
Provide practical advice and guidance to landowners on pollution prevention		Agency / FWAG	U						
Promote education and campaigns to highlight pollution prevention measures throughout industry and at home.		Agency	U		●	●	●	●	●

Issue 6 Effects of farming and forestry

Agriculture covers the majority of the plan area and is probably the principal influence on the local environment. Mixed and dairy farming takes place in the upper Tamar, moorland grazing on Dartmoor and Bodmin moor and mixed and dairy farming in the more sheltered areas towards the coast.

We provide practical advice and guidance to landowners on pollution prevention and work with other bodies such as FWAG to give advice in various forms.

Farming – There is a declining trend in the numbers of pollution incidents relating to farming. This has resulted from the extensive, proactive pollution prevention work carried out by the former NRA and the subsequent positive response from the farming community. However, there has been a slight increase in severe incidents in the upper Tamar area. The Agency is working with farmers on pollution prevention work.

However, farming is still having an impact on water quality and habitats within the catchment. Farming practices have caused or contributed to RQO non-compliance in the River Tamar, Bolesbridge Water, River Claw, River Deer and Colesmill Stream (see Appendix 3).

Sedimentation – We are concerned over the effects of silt on the fishery. Silt can come from many sources including agricultural and forestry activities particularly bank and bed erosion and runoff. Other sources include mineral extraction and quarrying. We need to assess the impact on eggs and young fish. As a precautionary measure we need to identify and reduce silt inputs. The Agency and other bodies work in partnership with farmers to identify and put into place management techniques in sensitive locations to reduce loadings of silt from the various sources.

The Agency and FWAG are currently funding a project to assess practical techniques to reduce the impacts of silt on watercourses for example, by the use of wetlands. The Agency is working in conjunction with the West Country Rivers Trust on the Tamar 2000 SUPPORT (Sustainable Practices Project On the River Tamar) on a programme of riverside fencing in appropriate locations to reduce erosion and the sedimentation of salmonid spawning gravel.

The Agency is currently undertaking a National R&D project to identify the sources of silt: whether this comes from topsoil as a result in changes in land use or from bank erosion.

Small Brook project – The Agency has been working together with local farmers investigating links between farming activity and deterioration in water quality through a study on the Small Brook, carried out over the last two years. The findings of the project show that most problems were of an intermittent and localised nature, generally as a result of poor waste management. The Agency produced an information leaflet with the assistance of local farmers and industry to raise awareness and promote the findings of the water quality study in the Small Brook catchment.

Siltation – Siltation and suspended solids in general are perceived as problems affecting fish stocks and water quality. This is sometimes linked with agricultural practices. Studies have indicated that the problem in this area is associated with bed and bank erosion as opposed to direct agricultural land use. Methods of reduction that could be used in appropriate locations include fencing and reducing stocking densities, providing alternative water to stock in troughs and stabilising land alongside rivers with permanent grass rather than rotational cultivation. The Agency is working with the West Country Rivers Trust on a programme of fencing in appropriate areas. To minimise future impact on the water environment, the Agency would like to encourage the use of permanent grassland swards to maintain soil stabilisation.

Forestry – The South West Forests Project aims to use forestry planting and management as a catalyst for positive land use changes, and stimulate other sectors of the rural economy through large scale planting. The project comes at a time of uncertainty and change in the long-established agricultural sector of the area. The Agency is keen to work with the project to ensure that proper consideration is given to the protection of existing habitats, particularly Culm grassland.

The area in the lower Tamar valley around Gunnislake has the ideal microclimate for tree growing and there are major commercial woodlands in the area. Pollution risks to the water environment from forests come primarily from poor harvesting techniques. A code of practice, 'Forest and Water Guidelines' published by the Forestry Authority in 1993, sets out ways to minimise such risks.

Upland Bodmin Moor Project – The Agency is a partner in this project, which seeks to promote conservation of wildlife and archaeological features with sustainable economic development on the farms of Bodmin moor.

The Groundwater Regulations – The Groundwater Regulations became fully adopted on 1 April 1999 and are intended to protect the quality of groundwater by :

- Preventing the discharge to groundwater of substances prescribed in List I (see Appendix 3, EC Dangerous Substances Directive)
- Limiting the discharges to groundwater of substances prescribed in List II

The regulation requires written authorisation from the Agency to tip for the purposes of disposal of any listed substance.

This is particularly relevant for sheep farming as the disposal of sheep dip will require an authorisation. The implementation of the regulations has been widely advertised and the Agency would advise potential applicants to make contact at the earliest possible opportunity. The Agency will give advice and guidance to any one who may be affected.

Actions	Tasks	Action By	Cost to Agency		Financial Year				
			(£)	Man days	99	00	01	02	03
Promotion of Soil Code, particularly in conjunction with changes of land use and crop patterns.	Promote good practice through day to day work, to work towards RQO compliance.	MAFF, Agency	U		■	●	●	●	●
Work with farmers and landowners, including part of the Bodmin Moor pilot project, to develop economic and environmentally sustainable farming		FWAG, Agency, MAFF, CCC, farmers, EN, WRCT	U		●	●	●		
Promote management schemes for wildlife stewardship to encourage positive management for Culm grassland and other important habitats.		FWAG, Agency, WCRT, EN, DWT, CWT,	U		■	●	●	●	●
Control of silt and diffuse pollution	Carry out campaign to solve problems of diffuse pollution by	Agency, FWAG, WCRT	U		●				
	- Research								
	- Producing guidelines								
	- Raising awareness								
	Advise on land management to prevent soil loss and pesticide runoff	Agency, FWAG	U						
	National research project into silt traps in redds and identifying the sources of silt	Agency, FWAG, WRCT	U			●			

Issue 7 Development pressures

The Agency is a statutory consultee on development plans and certain categories of planning application. This allows the Agency's views to be considered by the council prior to a planning application being decided or policies in a development plan being approved. For example, a proposed scheme to develop near a watercourse would be assessed by the Agency to ensure that it did not increase flood risk. If it were acceptable we might then seek to retain and enhance the area of the watercourse, improving the aesthetic, amenity and ecological qualities of the location. The Agency would wish to comment on a plan detailing this enhancement and would suggest that a streamside zone of at least 7 metres be set aside for this purpose.

The Agency has produced guidelines to local planning authorities on environmental policies and why they are important.

Sustainable development – In 1987, the World Commission on Environment and Development (the Brundtland Commission) defined sustainable development as that *which meets the needs of the present without compromising the ability of future generations to meet their own needs.*

Sustainable development brings together four principles - environmental protection, providing for the future, quality of life, and fairness - to create a new policy, which integrates environmental, developmental, social and economic concerns. One of the primary reasons for setting up the Environment Agency was to provide a means of helping the government deliver its sustainable development strategy. Section 4 of the Environment Act (1995) defines the Agency's aims and states that *the minister shall give statutory guidance on objectives and the contribution to sustainable development.* Guidance has been published by the former Department of the Environment; the key elements are that the Agency should:

- Take a holistic approach to the protection and enhancement of the environment
- Take a long-term perspective
- Maintain biodiversity by exercising its statutory obligations with respect to conservation
- Discharge its regulatory functions in partnerships with business in ways which maximise the scope for cost-effective investment in improved technologies and management techniques
- Provide high quality information and advice on the environment.

We will take forward these key elements by holistic environmental management, including this LEAPs process.

Consultation guides – The Agency produces consultation guides for each local planning authority which contain our recommendations for development restraints on environmental grounds. Planning authorities are encouraged to adopt the guides as policy. Consultation guides are revised and updated annually.

Flooding – Local planning authorities and ourselves are required by the DETR (in Circular 30/92 - Development and Flood Risk) to liaise closely on flooding and surface water runoff matters. The aim is to ensure that flooding risks that might arise from a development are recognised and made an integral part of the decision-making process undertaken by local planning authorities. Flooding and drainage issues are also to be taken fully into account during the preparation of land use development plans. In this respect we have responsibility to prepare

surveys under Section 105 of the Water Resources Act 1991 to define the nature and extent of flood risks. The initial Section 105 survey for main river (see Glossary) in the Plan area was completed in 1997 and has recently been updated as part of the recommendations from the Bye Report (see Issue 8). The survey has been extended to cover all ordinary watercourses.

Sustainable surface water drainage – The Agency is encouraging the adoption of source control: the selective use of structures such as soakaways as part of a development to promote infiltration of surface water runoff. These would help to replenish groundwater as well as reduce the erosion potential in watercourses; however, their use must be site specific. We inform developers and planners of these concepts through the provision of advice and information, including good practice guides on sustainable drainage.

Review of old mineral permissions – The Environment Act 1995 introduced new requirements for Mineral Planning Authorities to carry out an initial review and updating of old mineral planning permissions and the periodic review of all mineral permissions thereafter. The broad aims of the review are to provide for improved operational and environmental practices and for the appropriate restoration of mineral sites through updated planning conditions - although the nature of the new conditions will be constrained by a liability to pay compensation where they unreasonably prejudice the economic viability or the asset value of active mineral sites.

The Agency is a consultee in the process of determining new conditions, and this will require a thorough assessment of each site. Often sites, particularly those which have been dormant for many years, are of valuable nature conservation and archaeological interest. Clearly, many sites will be of geological interest, and may also have implications for surface and groundwater resources and quality. It is important that appropriate conditions are put in place to protect these interests.

Pressures of water resources – The availability of water resources is an increasingly important issue across England and Wales. Whilst the Government has said that it does not expect water resources to be a reason for development proposals being rejected, the provision of adequate water supplies could have an influence on the timing of developments.

The Agency comments on all county and district plans, and any individual planning applications that will have a significant water use, with respect to water resources and indeed water efficiency (as all new homes are now metered water efficiency can reduce customer's bills). However we can only comment on water resources in general as the specifics depend on which sources the relevant water company would plan to use to supply the development. In the light of this we would wish to see water companies added to the consultation list.

Wildlife – New development is one of the major threats to semi-natural habitats and the species they support. The Agency aims to protect features of significant conservation and ecological value through all the Agency's regulatory and internal consultations. Cornwall Wildlife Trust, through the LIFE project, are mapping the levels of change in semi-natural habitats, and what they have been converted to.

When commenting on planning applications, the Agency will normally request that a marginal strip of land of approximately 7 metres width is retained either side of any watercourse, or wetland habitat, within or alongside a development site. This measure seeks to retain functioning river wildlife corridors and wetland habitats, which have significant ecological, amenity and aesthetic value.

Actions	Tasks	Action By	Cost to Agency		Financial Year				
			(£)	Man days	99	00	01	02	03
Identify and review areas where the environment is at risk of impact from further development	Produce annual consultation guides for District Councils	Agency	U		●	●	●	●	●
Promote the adoption of development restraint areas.	Present revised consultation guides to planning committees and explain reasons for the need for development constraint	Devon and Cornwall County Councils, District Councils	U		■	●	●	●	●
Promote sustainable drainage	Promote principles of sustainable drainage to planning committees and officers.	Agency, Local Planning Authorities	U		●	●	●	●	●
	Encourage developers to consider the use of sustainable drainage on site-specific proposals	Agency	U		■	●	●	●	●
Control or minimise disturbance of former mining sites via planning procedures.		Devon and Cornwall County Councils	U		●	●	●	●	●

River flows vary widely and are affected by the weather, geology and land use. We manage flood risk from rivers and the sea using Flood Defence and Land Drainage powers. We manage flood defences and land drainage to balance the needs of all river users with the needs of the environment. Our duties and powers with regard to flood defence are described in Appendix 1.

Our statutory flood defence committees make decisions on flood defence. All rivers are classified as either 'main rivers' or 'ordinary watercourses' (sometimes referred to as 'non-main rivers'). We control work (through consents) and supervise flood defence matters on all watercourses, but have special powers to carry out work on main rivers. Local authorities have similar special powers for flood defence on ordinary watercourses.

Funding for capital improvement schemes is currently under pressure. Central government grant aid is now distributed according to national rather than regional priority. Alternative funding streams are being investigated for flood defence works, there has been a recent example of a successful bid for European funding.

When we design management systems for our flood defence work we fully consult conservation bodies. All options are explored when designing new schemes including flood storage in wetlands if possible.

Leaflets are available showing the main rivers and coasts where a flood warning service is provided.

Bye Report and Agriculture Select Committee – The severe flooding which affected large areas of central and eastern England and parts of Wales over the Easter weekend 1998 called for the Agency to take urgent action and to learn the wider lessons from this extreme event.

To help achieve this the Agency called for an independent investigation that would lay out plainly the facts about the floods and the Agency's handling of them. This investigation was carried out by Peter Bye and his technical advisor Dr Michael Horner and the report is known as the Bye report. In a Parliamentary Statement on 20 October 1998 on the Bye Report by the Minister Elliot Morley the Agency was given clear targets to achieve a seamless and integrated service of flood forecasting, warning and response by April 2000. To achieve this the Agency is required to undertake a thorough review of the whole system by mid-1999 to ensure the Agency is focused to deliver the required service, that management arrangements make this possible and that there are clear lines of accountability and responsibility.

The Agency, having considered the Bye Report, taken due regard of the Minister's statement, compared the needs of the Report with the findings of the Agriculture Select Committee on Flood and Coastal Defence 30 July 1998 and comments from MAFF, has drawn up a comprehensive action plan.

The action plan will be implemented nationally over the next eighteen months. The plan includes the following actions:

- Review of flood warning dissemination plans and major incident plans.
- Review current supervisory duties and develop new approach to their use.
- Review and publish consistent flood risk maps.
- Review emergency response arrangements with local authorities and carry out joint exercises using new arrangements. This must include clear understanding of the roles of all organisations involved.

- Introduce improvements in the Agency network of telemetered river flow monitoring.
- Carry out a complete visual survey of all flood defences including main river, ordinary watercourses, tidal and sea defences and in future carry out regular updates.
- Revise the Agency's National Flood Warning Strategy and establish a national flood warning centre.
- Review ways of warning the public, improve provision of data from telemetry systems and its use in giving warnings.
- Target flood warning communications at vulnerable temporary locations such as caravan and camping sites.
- Work with Government to review research into the impact of climate change on flood frequency.

In general, the South West region is further advanced than other regions in dealing with the issues raised in the actions listed above. However, a very large additional workload is still required to meet these actions.

As part of the actions listed under the Bye Report, we are carrying out a survey of all the sites used for flood warning to determine if they are capable of measuring the 1-in-100 year flood level. The survey is programmed to be completed by the end of September 1999. Following the results of this a programme of improvements will be drawn up to ensure that the stations are able to measure a 1-in-100 year flood.

Major Incident Plans – We also have a lead role in the Major Incident Plans for areas where there are large numbers of properties at risk from flooding. These plans are drawn together by the Agency with input from County Emergency Planning officers, the Police, Fire Service, Local Authorities and other relevant bodies. The Major Incident Plans are scheduled to be completed by Summer 1999.

Flood Warning Level of Service Study (FWLOSS) – Leaflets are available showing the main rivers and coasts where a flood warning service is provided.

The Flood Warning Level of Service Study for the Cornwall area commenced in April 1999 and is due to be completed by August 1999. The results from this study will identify locations where a flood service can be introduced or improved. Any improvements that are identified will be assigned priority taking into account the needs of the whole region and the requirements of the Bye report.

Maintenance – Regular maintenance is essential if the river system and sea defences are to operate properly at times of flood. Such maintenance works include vegetation control, repairs to earth embankments and other floodwalls, obstruction and blockage removal and dredging.

The cost of maintenance varies each year depending on need; it is generally in the order of £50,000 for the plan area. Annual conservation liaison meetings are held to outline our maintenance programme to external conservation bodies. Each year within this programme some conservation enhancements and recreational improvements are carried out.

Actions	Tasks	Action By	Cost to Agency		Financial Year				
			(£)	Man days	99	00	01	02	03
Delivery of Bye Report actions		Agency	U		●	●	●	●	●
Determine future flood warning strategy and programme.	Complete Flood Warning Levels of Service Study	Agency,	10k		●				
	Identify improvements as regional priority list	Agency	U		●	●			
	Implement improvements on regional priority list	Agency	U		●	●	●	●	

Issue 9 Effects of metalliferous mining and quarrying

The southern part of the plan area was historically one of the most important and intensively mined areas in the South West, particularly for copper and arsenic. In its heyday, in the late nineteenth century, the area around Gunnislake produced nearly half the world's arsenic. Mining activities have left a legacy of effects on the environment : elevated levels of copper and zinc in watercourses, altered groundwater flows through underground workings and abandoned spoil heaps.

Management of historic mining sites – Many former mining sites are particularly rich in unusual bryophyte (mosses and liverworts) communities, others are important for dragonflies and damselflies. These sites can have significant industrial archaeological importance and may need protecting and preserving rather than remediation.

The high arsenic, copper and zinc content of spoil tips stops much vegetation growing on the tips. This, combined with often unauthorised leisure activities, can lead to potentially harmful dust being released from the tips. The local authority takes a lead role in potential environmental health issues.

Cornwall County Council, as a mineral planning authority, has recently produced a strategy for former mining sites in parts of the Tamar Valley. The Agency has commented on the proposals and seeks to work in partnership to minimise adverse effects on the environment. During any work on spoil heaps or contaminated sites any soil containing metalliferous mining waste exported off site must be handled in an appropriate manner. We advise on suitable methods, on a site-specific basis, as part of our core work.

Contaminated land – New legislation on treatment of identified contaminated land will be in place by the end of 1999. Local authorities will be identifying areas of contaminated land. The Agency is a consultee on proposals for restoration and remediation of contaminated land by local authorities, developers or landowners. Where sites are identified as 'special sites' such as former MoD sites, or heavily contaminated closed sites, the Agency will be responsible for regulating their remediation.

Water quality – General mine drainage and unmonitored stretches of watercourses may contribute to these Directive failures. Routine monitoring is in place to identify metalliferous inputs.

Actions	Tasks	Action By	Cost to Agency (£) Man days	Financial Year 99 00 01 02 03
Minimise the effects of historic mining areas	Work in partnership to carry out appropriate proposals in the Tamar Valley strategy	Local Planning Authorities, Agency		

Issue 10

Waste management

Household, commercial and industrial wastes can be potentially polluting if not correctly managed. Certain particularly harmful materials are designated as 'special wastes' (see Glossary) and 90 per cent of these are exported from the area for specialised treatment or disposal elsewhere at purpose-built facilities.

With the exception of household wastes, for which closely monitored collection and disposal contracts are in place, there is only sparse information on the types and quantities of wastes generated. Some estimates are being made as part of county councils' waste management strategy in their Waste Local Plan for Devon and Cornwall. The Agency is to produce a Strategic Waste Management Assessment for the Region, based on an analysis of the waste production survey and taking account of the proposed Statutory National Waste Strategy. This will be produced in 1999 with an intended publication date early in 2000.

The Government has stated its intention to redefine mining, quarrying and agricultural wastes as 'controlled wastes' to be formally regulated by the Agency. The Agency welcomes this step, as it would be an extra tool available for controlling the potential effects of such wastes.

The Groundwater Regulations – The Groundwater Regulations became fully adopted on 1 April 1999 and are intended to protect the quality of groundwater by:

- Preventing the discharge to groundwater of substances prescribed in List I (see Appendix 3, EC Dangerous Substances Directive)
- Limiting the discharges to groundwater of substances prescribed in List II

Regulation 15 of the Waste Management Licensing Regulations 1994 transposes into UK law those provisions that relate to the disposal of waste, or tipping for the purposes of disposal, under the authorisation of a Waste Management Licence.

The Agency will be reviewing the licences for waste disposal sites, which receive List I and II substances, to ensure that they are compliant in accordance with the requirements of regulation 15.

Organisations responsible for Waste Management – There are a number of bodies responsible for the planning and regulation of waste collection, management and disposal:

The Environment Agency – The Agency has a wide range of responsibilities relating to waste management both locally and at a national level.

- We regulate and advise organisations and individuals that are involved in the transportation, handling, treatment and disposal of controlled wastes. We also carry out monitoring and enforcement activities to ensure that waste management licence conditions are met.
- We play an active role in the development of the national waste strategy, for example, in carrying out the national waste production survey, and in supporting waste minimisation schemes.
- We advise both county and district councils on waste matters. We also work in partnership with local authorities to control fly-tipping.
- We work with government on the development of policy.
- We provide information to the public and interested bodies through the public registers, technical guidance documents, and LEAPs

- We carry out Research and Development to ensure that our activities are based on a sound scientific basis

Central Government – The government is responsible for the development of a Statutory National Waste Strategy for England and Wales, which is due for completion in early 2000, to address the following:

- Ensure waste is managed without endangering human health or the environment.
- Establish a network of adequate waste disposal facilities taking account of best available technologies.
- Encourage the prevention or reduction of waste production.
- Encourage the recycling, reuse, reclamation and use of waste as a source of energy.

County Councils – The County Councils are the waste planning authority and the waste disposal authority. As waste planning authorities they are responsible for developing a countywide waste strategy, the Waste Local Plan. They also have responsibility for determining planning applications relating to waste management activities. As the waste disposal authorities they are responsible for arranging for the disposal of household and commercial waste and the provision of civic amenity sites.

District Councils – As the waste collection authority, district councils have the responsibility for the collection and management of household waste.

Waste Contractors – There are a number of waste contractors operating within the plan area. The principal operators for the disposal of household waste in Devon and Cornwall are Plymouth Unitary Authority, Devon Waste Management Ltd and County Environmental Services Ltd the latter two are wholly owned by the county councils and manage landfill sites and transfer stations. The two companies are contracted to take all household waste produced in the two counties, except in Plymouth where the Unitary Authority undertakes its own household waste collection.

Provision of waste facilities – There is an established hierarchy for planning of waste, from national strategy to regional and local planning. There is a requirement from the Agency to produce a regional strategy to outline the current and future needs for waste management. This work will be undertaken in two distinct phases; first, data on current requirements have been collected in a waste arisings survey. This information will also feed into the national strategy. The second stage is the production of the regional strategy. The survey will be completed in the summer of 1999.

Waste spreading to land – Certain controlled wastes may be spread on land where an agricultural benefit or ecological improvement can be demonstrated. Land is already being used for spreading agricultural and some industrial wastes, particularly in the area around the headwaters of the Rivers Inny, Ottery and Kensey and the Gunnislake area. These headwaters are important spawning grounds for salmonids, the Agency works closely with the waste spreaders to ensure that any activity at these sites is closely monitored, this includes regular inspections and random sampling.

On 31st December 1998, the disposal of sewage sludge to sea was prohibited by the EC Urban Waste Water Directive, thus increasing disposal to land. These wastes can be spread under exemption from waste management licensing provided that the applicant can demonstrate that the activity will not:

- Cause harm to the environment

- Present risk to water, air, soil, plants or animals
- Cause nuisance through noise or odour
- Adversely affect the countryside or places of special interest.

The Agency is currently reviewing its internal guidance on the processing of land spreading applications to ensure that potential pollution effects or habitat loss do not occur.

We will continue to ensure that operators use good management practices and use existing codes to minimise the risk of pollution.

Landfill Tax – The Landfill Tax was introduced in October 1996 and is payable by landfill operators to HM Customs & Excise for waste deposited in landfill sites. The tax was raised to £10 per tonne for general waste from the 1st April 1999 and will rise by a further £1 per tonne for each of the next five years. The tax for inert materials will remain unchanged at £2 per tonne.

Disposal of leachate from landfill sites – Leachate from landfill sites can present a risk to water quality. The management of leachate is subject to waste management licensing and any discharge to a watercourse must be consented by the Agency.

Devon Waste Management limited are currently in discussion with the Agency to formulate a long-term leachate management strategy for Combebow Landfill Site. This will include leachate recirculation and the capping and restoration of completed phases to reduce leachate generation on the site. Disposal outlets are also being reviewed.

The Agency is also in discussion with Devon County Council regarding the final restoration of the closed landfill site at Anvil Corner. We are awaiting an application for a licence to keep and treat leachate at the site. An application for consent to discharge treated leachate has been received.

Fly-tipping – We work in liaison with local authorities and communities to identify those areas regularly affected by fly-tipping and to take appropriate action. Fly-tipping is a problem in all areas and the response and responsibility for such incidents has been for some time a little unclear. For this reason there has been a memorandum of understanding drawn up between the Environment Agency and the Local Government Association outlining the level of response by each body in the event of fly-tipping incidents. This will ensure that each incident is dealt with in the most appropriate manner.

Fly-tipping will result in a prosecution when those responsible can be identified, however everyone has a personal responsibility to ensure that their waste is disposed of correctly.

Producer Responsibility for Packaging Waste Regulations – The Producer Responsibility for packaging Waste Regulations which became law in 1997 set targets for the recovery and recycling of packaging waste. The current targets are under review, but in order to comply with European requirements the targets for 2001 are 52 per cent recovery with 16 per cent of this recycled. These targets will provide a powerful stimulus to the development of an improved level of recovery over the next three years. All businesses, which fall within the regulations, must either register with the Agency or join a business membership scheme. The Agency is the regulatory body for this legislation and offers advice on the regulations and their implementation.

Holsworthy Bio-gas scheme – The Bio-gas scheme is a proposal to pilot the use of cattle slurry to produce electricity. The Agency is engaged in preliminary discussions with the project team regarding waste licensing requirements.

Waste exemption licensing – The Agency currently has a national initiative to carry out a review of policy on waste exemption licensing.

Actions	Tasks	Action By	Cost to Agency		Financial Year					
			(£)	Man days	99	00	01	02	03	
Identification of new waste management sites through consultation on Devon and Cornwall Waste Local Plan.	Advise planning authorities and waste management companies on Agency requirements	County Councils, waste management companies	U							
Encourage recycling facilities	Seek to ensure Agency interests are considered in Local Authority promotions	Local Authorities / Agency	U		●	●	●	●	●	
Promote waste minimisation	Provide support for initiatives by businesses, PAYBACK, Groundwork, and local authorities, and seek to ensure Agency interests are considered in such promotions	Local Authorities / Agency	U		■	●	●	●	●	
Campaign to highlight fly-tipping problems.	Where opportunities arise	Local Authorities, Agency	U							
Encourage good practice whilst waste spreading to land	Encourage good practice whilst waste spreading to land by liaising with spreaders	Agency spreaders, landowners, local authorities	U		■	●	●	●	●	
	Closely monitor and inspect waste spreading sites to ensure there is no impact upon salmonid spawning grounds	Agency, spreaders, landowners,								
Determination of licence at Anvil Corner	Apply for licence	Devon County Council	U		●					
	Determine licence	Agency	U		●					
Ensure compliance with the Groundwater Regulations and Regulation 15 of the Waste Management licensing Regulations 1994	Carry out a review of licences for landfill sites which are subject to the regulations.	Agency DWM, CES	U							
Find best environmental option for Combebow landfill site	Agree leachate management plan for the treatment and disposal of leachate from Combebow landfill site	DWM, Agency	U		●					

Issue 11 Effects of effluent discharges

Rivers and seas have a natural ability to render the main constituents of many effluents harmless, providing that effluent disposal is properly controlled. Throughout the area there are numerous sites where the Agency consents the discharge of effluent into surface waters (freshwaters, estuaries and coastal waters) and groundwater. Discharge consents only apply to point source discharges: specific, identifiable discharges of effluent from a known location.

Discharges, which have the greatest potential to affect the quality of the water environment, have numeric concentration limits attached to their consents. These limits may apply to individual substances or to groups of substances and are set at levels needed to protect the environment from harm and ensure compliance with River Quality Objectives (RQOs), EC Directives and International Conventions.

Diffuse sources of pollution, such as agricultural runoff and urban or highway runoff, have to be tackled using other regulatory powers.

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

OFWAT is undertaking a review of water prices which will result in a review of improvements required for the period 2000-2005; the outcome of this will be AMP3. The Environment Agency has been reviewing, for agreement with the DETR, those sewage discharges where improvement is required. The DETR have now considered our proposals and have translated these into detailed environmental obligations, where we expect the improvements to take place by 2005. Many of these schemes will be delivered before 2005; the water companies are currently preparing their Strategic Business Plans which will confirm the delivery dates of these schemes. The schemes put forward for improvement can be found in Appendix 3.

Effluent disposal issues – Pyworthy STW caused RQO non-compliance in Derril Water (see Appendix 3). The discharges from Holsworthy, Lydford and Lewannick STWs could cause non-compliance with the RQO in the receiving water, if the STWs were operating to the maximum limit of their consent. In addition Lewannick STW requires secondary treatment to meet the requirements of the Urban Waste Water Treatment Directive (see Appendix 3). We expect improvements at all these works to be carried out in AMP3.

Management of private treatment works – Private sewage treatment plants, especially for sites that have seasonal fluctuations in populations, can have serious environmental impacts on their receiving environments. This is often due simply to a lack of understanding of the function of the systems being used. Basic understanding and maintenance of these facilities could prevent such impacts and the potential for enforcement action from the Agency.

Actions	Tasks	Action By	Cost to Agency		Financial Year				
			(£)	Man days	99	00	01	02	03
Protection of downstream RQO	We expect improvements to Pyworthy STW to be completed in AMP 3	SWW	U						
	We expect improvements to Holsworthy STW to be completed in AMP 3	SWW	U						
	We expect improvements to Lydford STW to be completed in AMP 3	SWW	U						
Compliance with Urban Waste Water Treatment Directive and protection of downstream RQO	We expect improved secondary treatment to be installed at Lewannick STW in AMP 3	SWW	U						
Promote good management of private sewage treatment plants	Produce leaflet to promote care and maintenance of seasonally affected private STWs	Agency	U						

Issue 12 Unknown causes of poor water quality

We will prioritise investigations into the reasons for RQO non-compliance. We will investigate all significant failures and persistent marginal failures. Investigations into non-persistent marginal failures will be undertaken where resources allow.

Actions	Tasks	Action By	Cost to Agency (£) Man days	Financial Year 99 00 01 02 03
Improvement of water quality	Set priorities and investigate any causes of RQO non-compliance and take actions as appropriate	Agency		

Many people enjoy water areas such as rivers, canals and still waters for a variety of activities. There is recreational use throughout the plan area, with a large proportion based on the moors or on or around the water, including access limited to British Canoe Union members to canoe between Greystone bridge and Gunnislake at certain times of the year. Much of this can be absorbed without unacceptable impact on the environment or conflict between competing uses. However, instances do occur where recreational activities need to be more carefully managed and the Agency is currently undertaking a National research project to assess the impact of recreation on wildlife and the environment.

Sustainability is an underlying theme to the activities of the Agency and we will balance the promotion of recreation and management with the needs of other interests, such as wildlife.

There are a number of key organisations with an interest in countryside and water recreation and we will work in partnership where appropriate to achieve the greatest results. We will meet locally with landowners and interested parties such as the British Canoe Union, Countryside officers and the National Trust to ensure that sustainable recreation issues and actions within the area are fully discussed and that fishing interest and riparian owners are considered.

Cycleways and footpaths – The sustainable transport organisation Sustrans is developing a series of traffic-free routes across Britain. We are supportive of new routes where they can be managed without adverse effects on the environment or other users, and will assist whenever possible through, for example, providing bridges where they currently do not exist. The Agency provides advice on the appropriate use of walks alongside rivers and canals.

Bude Canal – The recent feasibility study commissioned by North Cornwall District Council was completed in December 1998. Its recommendations were for restoration of key heritage sites along the canal including restoration of the Barge canal, rewatering of sections of the aqueduct and restoration of surviving historical features. The Agency is keen to have early input into these proposals to ensure that the environmental implications are fully taken into account, such as any impact on wildlife that increased access to the canal may cause.

Tamar Valley – Cornwall County Council has recently produced a strategy for former mining sites in parts of the Tamar Valley. The strategy includes assessing recreational potential at some sites.

Actions	Tasks	Action By	Cost to Agency		Financial Year				
			(£)	Man days	99	00	01	02	03
Consider proposals for restoration of Bude canal		NCDC, Agency, SWW	U		●	●			
Promote sustainable methods of managing recreation	Consider appropriate measures to limit damage to wildlife through recreational activity such as educational campaigns	Agency / BAP partners	U		●	●	●	●	●
	Promote the river call information service - which gives the levels of certain rivers, including the Tamar	Agency	U	U	■	●	●	●	●

Environmental actions in the Tamar Estuary

Actions to help safeguard the environment of the Tamar Estuary are covered in the Tamar Estuary and Tributaries LEAP Action Plan, available from the address at the front of this plan.

Appendices

Appendix 1: Duties, powers and interests of the Environment Agency

The Environment Agency has a wide range of interests in the areas of water management, waste management and pollution prevention and control. Whilst many of these interests are supported by statutory duties and powers, much of our work is advisory, with the relevant powers resting with other bodies such as local planning authorities. For example, we are not responsible for :

- Noise problems (except if it is to do with our work)
- Litter (unless it is restricting the flow of a river)
- Air pollution arising from vehicles, household areas, small businesses and small industry
- Collecting waste in your local area
- Planning permission
- Environmental health
- Food hygiene

These are all dealt with by your Local Planning Authority who will contact us if necessary.

We are not responsible for the quality or supply of drinking water at the tap or for treating sewage waste, although we regulate discharges from sewers and sewage treatment works.

The following table summarises our duties, powers and interests and their relationship to land-use planning.

Agency Duty	The Agency has powers to:	The Agency has an interest (but no direct powers) in:	Partnership
<p>Water Resources 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. ● Revoke or vary existing licences to reinstate flows or levels to surface-waters or groundwater which have become depleted as a result of abstraction, and are subject to a liability for compensation. ● Secure the proper use of water resources through its role in water-resources planning, the assessment of reasonable need for abstractions and promotion of more efficient use of water resources. ● Monitor and enforce abstraction and impoundment licence conditions. 	<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. 	<p>The Agency is committed to water-demand management and will work closely with water companies and developers, local authorities and relevant organisations to promote the efficient use of water. The Agency acknowledges that new resources may be needed in the future and supports a twin-track approach of planning for water resource development alongside the promotion of demand-management measures. The Agency seeks to influence planning decisions for new development by encouraging the inclusion of water-conservation measures in new properties, particularly in areas where water resources are under stress, and by ensuring that planning authorities allow for the lead time for resource development.</p>
<p>Flood Defence 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, the development or construction of a structure that would affect the flow of an ordinary watercourse (Water Resources Act, 1991 Section 109, 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 workings within 16 metres 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. 	<p>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.</p> <p>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.</p> <p>The Agency works with the civil authorities to prepare flood-warning dissemination plans and supports their endeavours to protect communities at risk.</p>

Agency Duty	The Agency has powers to:	The Agency has an interest (but no direct 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 and into or onto land in respect of water quality through the issue and enforcement of discharge consents. ● Prosecute polluters and recover the costs of clean-up operations. 	<ul style="list-style-type: none"> ● The control of runoff from roads and highways. This is a Highway Agency duty. ● The greater use of source-control measures to reduce pollution by surface-water runoff. ● Prevention and education campaigns to reduce pollution incidents. 	<p>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>
<p>Air Quality</p> <p>The Agency has a duty to implement Part 1 of the Environment 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. 	<p>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>
<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. 	<p>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.</p>

Agency Duty	The Agency has powers to:	The Agency has an Interest (but no direct 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. 	<p>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>
<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. 	<p>The Agency supports land remediation and will promote this with developers and local authorities and other stakeholders.</p>
<p>Conservation</p> <p>The Agency will further conservation, wherever possible, when carrying out water-management functions; have regard to conservation when carrying out pollution-control functions; and promote the conservation of flora and fauna which are dependent on an aquatic environment.</p>	<ul style="list-style-type: none"> ● The Agency has no direct conservation powers, but uses its powers with regard to water management and pollution control to exploit opportunities for furthering and promoting conservation. 	<ul style="list-style-type: none"> ● The conservation impacts of new development. These are controlled by local planning authorities. ● Protection of specific sites or species, which is a function of English Nature. The Agency does, however, provide advice to local authorities and developers to protect the integrity of such sites or species. ● Implementation of the UK Biodiversity Plan for which it is the contact point for 12 species and one habitat. 	<p>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>

Agency Duty	The Agency has powers to:	The Agency has an interest (but no direct powers) in:	Partnership
<p>Landscape 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. 	<p>The Agency produces 'River Landscape Assessments and Design Guidelines' which it uses when working with Local Authorities and developers to conserve and enhance diverse river landscapes.</p>
<p>Archaeology 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 or archaeological or heritage interest. This is carried out by local planning authorities, County Archaeologists and English Heritage. 	<p>The Agency will liaise with those organisations which have direct control over archaeological and heritage issues to assist in the conservation and enhancement of these interests.</p>
<p>Fisheries The Agency has a duty to maintain, improve and develop salmon, trout, freshwater and eel fisheries.</p>	<ul style="list-style-type: none"> ● Prosecute offenders who use illegal methods to take fish and can seek forfeiture of all associated equipment. ● Regulate fisheries by a system of licensing. ● Make and enforce fisheries byelaws to prevent illegal fishing. ● Promote the free passage of fish and consent fish passes. ● Monitor fisheries and enforce measures to prevent fish-entrainment in abstractions. ● Promote its fisheries duty by means of land-drainage consents, water abstraction applications and discharge applications. ● Regulate the introduction of fish species to rivers and lakes. 	<ul style="list-style-type: none"> ● The determination of planning applications which could affect fisheries. 	<p>Many development schemes have significant implications for fisheries. The Agency will work with anglers, riparian owners, developers and local authorities to protect fisheries.</p>
<p>Recreation 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. This is carried out by the English Sports Council and other sports bodies. 	<p>The Agency will work with the Countryside Commission, the Sports Council, British Waterways and other recreational and amenity organisations to optimise recreational use of the water environment.</p>

Appendix 2: Organisations who responded to the public consultation

- Altarnun Parish Council
- British Canoe Union
- British Marine Industries Federation
- Calstock Parish Council
- Clean Rivers Trust
- Dartmoor National Park Authority
- Devon County Council
- English Nature
- Exeter Canoe Union
- Falmouth Marine School
- Holsworthy Hamlets Parish Council
- Camborne School of Mines
- MAFF
- National Farmers Union
- Ramblers Association (Devon)
- RSPB
- Sports England
- Tamar Canoe Association
- The Inland Waterways Association
- West Devon Borough Council

Appendix 3: The quality of surface waters

River Quality Objectives – The water quality targets that we use for managing water quality are known as River Quality Objectives (RQOs); these are based on the River Ecosystem (RE) classification scheme. The RE classification comprises five hierarchical classes as summarised below:

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

The rivers of the Freshwater Tamar and Tributaries Catchment have been divided into 56 classified stretches and the RQOs and LT RQOs for these stretches are shown in the table below.

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

In certain circumstances we can 'set aside' data, that is we will not take into account some or all of the results of a particular determinand when we assess compliance with an RQO. We will set aside data where high concentrations of metals, or low pH, are caused by the natural geology of the catchment. This allows us to protect good water quality reflected by other parameters in the RE classification.

We also manage water quality by applying standards set in EC directives and other international commitments. Failures to comply with these standards are outlined in the following sections.

Water	Stretch	Length km (*Area km ²)	Compliance	Reason(s) for non-compliance
Tamar	Eastcott to Upper Tamar Lake inflow	3.4	Compliant	
Tamar	Upper Tamar Lake	*32.8	Non-compliant 1997 (pH)	Trend of summer non-compliance associated with drought conditions and caused by blue-green algal blooms. Phosphorus has been identified as the key nutrient (see issue 4).
Tamar	Lower Tamar Lake	*16.2	Non-compliant 1997 (pH)	Linked to blue-green algal blooms occurring in hot weather, with phosphorus being identified as the key triggering factor. Algal blooms in the lake were overflowing into the River Tamar (see issue 4).
Tamar	Lower Tamar Lake Outflow to Tamarstone Bridge	9.4	Compliant	
Tamar	Tamarstone Bridge to Polson Bridge	32.5	Compliant	
Tamar	Polson Bridge to Normal Tidal Limit	28.7	Compliant	
Inny	Trewinnow Bridge to Two Bridges	13.5	Compliant	
Inny	Two Bridges to confluence with River Tamar	15.6	Compliant	
Penpont Water	Trelyn Bridge to confluence with River Inny	11	Compliant	
Lowley Brook	Trekelland to confluence with River Tamar	3.4	Compliant	
Lyd	Greenlades Bridge to confluence with River Tamar	9.2	Compliant	
Thrushel	Stowford Bridge to confluence with River Lyd	5.3	Compliant	
Wolf	Week's Mill Bridge to Roadford Reservoir inflow	1.6	Compliant	
Wolf	Roadford Reservoir	*295	Compliant	
Wolf	Roadford Reservoir outflow to confluence with River Thrushel	5.9	Compliant	
Kensey	Badharlick Bridge to confluence with River Tamar	10.2	Compliant	
Carey	Middle Bridge Virginstow to confluence with River Tamar	9.2	Non-Compliant 1995 (dissolved O ₂)	Caused by prevailing drought conditions, which resulted in low flows. Not an issue.
Ottery	Canworthy Bridge to confluence with River Tamar	18.2	Compliant	
Claw	Tetcott to confluence with River Tamar	3.1	Non-Compliant 1995 (dissolved O ₂)	Caused by prevailing drought conditions, which resulted in low flows. Not an issue.
Deer	Ford Mill to confluence with River Tamar	3.5	Compliant	

EC Directives

EC Freshwater Fish Directive – The EC Directive on the quality of waters needing protection or improvement in order to support fish life (78/659/EEC) ensures that water quality in designated stretches of water is suitable for supporting certain types of fish.

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

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

Stretches of the Freshwater Tamar and Tributaries Catchment which are designated under the Freshwater Fisheries Directive are listed below, along with a record of their compliance with the Directive, 1995 to 1997. All stretches support salmonid populations except for the Lower Tamar Lake, which supports cyprinid populations. A derogation for pH exists in the stretch of the River Tamar from Polson Bridge to the normal tidal limit.

EC Surface Water Abstraction Directive – The EC Directive *concerning the quality required of surface water intended for the abstraction of drinking water in the Member States* (75/440/EEC) protects the quality of surface water used for public supply. This Directive ensures that water abstracted for public supply meets certain quality standards and is given adequate treatment before entering public water supplies.

The Directive sets out standards that must be achieved, for water for public supply, which is to be given different levels of treatment.

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

There are three identified surface water abstraction points in the catchment; these are at Upper Tamar Lake (NGR: SS 289 118), Roadford Reservoir (NGR: SX 423 901) and the River Tamar at Gunnislake (NGR: SX 4337 7235). All three sites were compliant with the Surface Water Abstraction Directive for the years 1995 to 1997.

EC Dangerous Substances Directive – The EC Directive *on pollution caused by certain substances discharged in the aquatic environment of the community* (76/464/EEC) protects the water environment by controlling discharges to rivers, estuaries and coastal waters.

This Directive describes two lists of compounds. List I contains substances regarded as particularly dangerous because they are toxic, they persist in the environment and they bioaccumulate. Discharges containing List I substances must be controlled by Environmental Quality Standards (EQSs) issued through Daughter Directives. List II contains substances which are considered to be less dangerous but which can still have a harmful effect on the water environment. Discharges of List II substances are controlled by EQSs set by the individual Member States.

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

We monitor two designated sites for List I substances in the Freshwater Tamar and Tributaries catchment. There is also a National Network site on the River Tamar at Gunnislake Bridge, which is monitored for all List 1 substances.

Monitoring Site	NGR	Receiving Water	Monitored Substance	Compliance / Non Compliance
100 yards downstream of Holsworthy (Derriton) STW	Site NGR: SS339032 (STW NGR: SS34100330)	Colesmill Stream	Hexachlorocyclohexane (HCH)	Compliant 1995, 1997. Compliance could not be assessed in 1996 due to a sampling shortfall (less than 12 samples were collected).
Gunnislake gauging station downstream of discharge from Hingston Quarry	Site NGR: SX42657250 (STW NGR: SX40507230)	River Tamar	Cadmium	Compliant 1995, 1996, 1997.
Gunnislake Bridge (National Network Site)	Site NGR: SX433723	River Tamar	All List 1 substances	Compliant 1995, 1996, 1997.

We also monitor the site at Gunnislake gauging station for List II substances.

Monitoring Site	Monitored Substances	Non-compliant substances and reasons for failure
Gunnislake gauging station downstream of discharge from Hingston Quarry	Arsenic Chromium Copper Lead Nickel Zinc	Copper: 1995, 1996, 1997. Exceedances have not been linked to any reported pollution incident. There appears to be a seasonal trend with non-compliance being skewed towards summer and autumn. Area data for Hingston Quarry (which is consented for total copper) shows that the concentrations here do not match the higher concentrations at the downstream sampling site. The site has previously been investigated (INV/95/005) and it was found that the principal source of copper is from abandoned mines in the vicinity of Hingston Quarry, rather than from the Quarry itself.

EC Urban Waste Water Treatment Directive – The EC Directive concerning urban wastewater treatment (91/271/EEC) specifies minimum standards for sewage treatment and sewage collection systems.

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

This Directive also requires higher standards of treatment for discharges to sensitive areas. Sensitive areas are those waters that receive discharges from population equivalents of greater than 10,000, and are, or may become, eutrophic in the future.

The DETR decide if a watercourse is sensitive, based on monitoring information provided to them by the Environment Agency. We also ensure that discharges to sensitive areas receive a higher level of treatment. We are responsible for auditing the results of these studies.

Lewannick STW has been identified as requiring appropriate treatment to meet the requirements of the Urban Waste Water Treatment Directive.

There are currently no sensitive areas in this catchment. However, monitoring is being carried out to determine whether sensitive designations should be sought under the Urban Waste Water Treatment Directive for the River Tamar from St. Leonard's (Launceston) STW to the tidal limit and for the stretches of the Rivers Lyd, Inny and Kensey immediately upstream of their confluences with the River Tamar.

Sewage Treatment Improvement Plans – We expect improvements to several STWs in the Freshwater Tamar and Tributaries catchment to be carried out in AMP3; these are shown in the table below along with the reasons why the improvements are required.

STW	Class Description
Pyworthy	Ensuring compliance with RQO
Holsworthy (Derriton)	Ensuring compliance with RQO
Lydford	Ensuring compliance with RQO
Lewannick	Meeting the requirements of the UWWTD and ensuring compliance with RQO.

Abbreviations

AMP	Asset Management Plan
BAP	Biodiversity Action Plan
BATNEEC	Best Available Technology Not Entailing Excessive Cost
BPEO	Best Practicable Environmental Option
BOD	Biochemical Oxygen Demand
CWT	Cornwall Wildlife Trust
DETR	Department of the Environment, Transport and the Regions
DWM	Devon Waste Management
DWT	Devon Wildlife Trust
ECCI	English China Clay International
EN	English Nature
EQS	Environmental Quality Standard
EU	European Union
FWAG	Farming and Wildlife Advisory Group
GIS	Geographic Information System
HNDA	High National Dispersion Area
HSE	Health and Safety Executive
IPC	Integrated Pollution Control
LPA	Local Planning Authority
LTRQO	Long Term River Quality Objective
MAFF	Ministry of Agriculture, Fisheries and Food
MI	Megalitre (=1 million litres)
MI/d	Megalitres per day
NASCO	North Atlantic Salmon Conservation Association
NCDC	North Cornwall District Council
NGR	National Grid Reference
NRA	National Rivers Authority
REFRAC	Regional Fisheries, Ecology and Recreation Advisory Committee
RHS	River Habitat Survey
RQO	River Quality Objective
SSA	Strategic Supply Area
SSSI	Special Site of Scientific Interest
STW	Sewage Treatment Works
SWRA	South West Rivers Association
SWW	South West Water Limited
TTFA	Tamar and Tributaries Fisheries Association
UWWTD	Urban Waste Water Treatment Directive
WCRT	West Country Rivers Trust

Glossary

abstraction – Removal of water from a surface or groundwater source of supply.

adit – Gently sloping passage from mine workings into valley areas to allow water to drain out of the working. The downstream entrance is called the adit portal.

algal blooms – A visible, often seasonal occurrence of very large numbers of algae floating in fresh water or sea.

anthropogenic – Resulting from or influenced by man's activities.

arisings – Quantities of waste being generated.

aquifer – Layer of porous rock able to hold and transmit water. Often classified as major, or minor, depending on the extent to which they support higher yielding borehole systems.

baseflow – The flow in a river comprising emergent groundwater sources. In dry conditions river flows comprise entirely of baseflow.

biochemical oxygen demand (BOD) – A measure of the amount of oxygen consumed in water, usually as a result of organic pollution.

bryophytes – Mosses and liverworts.

buffer zone – Strip of land 10-100m wide, alongside rivers which is removed from intensive agricultural use and managed to provide appropriate habitat types. Benefits include potential reduction of inputs into the river such as silt, nutrients, livestock waste, as well as improving habitat diversity and landscape.

clitter – Clitter (the local name for scree) is the accumulation formed by fragments of rock resulting from mechanical weathering. In the case of clitter, periglacial weathering has caused its formation.

compensation flow – A defined release from a reservoir to compensate for the impact of the impoundment by maintaining a minimum flow in the river downstream.

consent – A statutory document issued by the Environment Agency under Schedule 10 of Water Resources Act 1991 to indicate any limits and conditions on the discharge of an effluent to controlled water.

controlled waste – Is waste from household, commercial or industrial sources, which may be solid or liquid. It does not have to be hazardous or toxic.

culm measures – A distinct area of North East Cornwall, extending into Devon, characterised by poor soils and rushy pastures, the Culm measures contain many important habitats and species.

culvert – Channel or conduit carrying water across or under a road, canal etc.

cyprinid – Fish of the carp family (i.e. coarse fish).

determinand – That which is to be determined or measured.

drought order – Drought Orders are made by the Secretary of State upon application by the Environment Agency or a water undertaker, under powers conferred by Act of Parliament, to meet deficiencies in the supply of water due to exceptional shortages of rain. The terms and conditions under which Drought Orders may be obtained are given in Sections 73-81 of the Water Resources Act 1991 and Sch 22 S139 of the Environment Act 1995. Drought Orders are sub-divided into 'Ordinary' and 'Emergency' Drought Orders. A Drought Order could contain provisions such as: to authorise abstraction from an unlicensed source, override the conditions on an existing abstraction licence, limit the amount of water which may be taken from a source, vary discharge conditions or might allow the prohibition of use of water for particular purposes, to allow a ban on non-essential use of water (for example in car washes) or to introduce the use of stand-pipes.

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 natural ageing of a lake or land-locked body of water results in organic material being produced in abundance due to a ready supply of nutrients accumulated over the years. Eutrophication can be greatly increased as a result of nitrate and phosphates in fertiliser runoff or sewage treatment works.

fluvial – Pertaining to river flow and its erosive activity.

grilse – Atlantic salmon that have remained in the sea for only one winter.

licence of entitlement – Licence granted under Schedule 26 of the Water Act 1989 in respect of a previously exempt abstraction greater than 20m³/day which required a licence by virtue of an amendment to Section 24(2) and (3) of the Water Resources Act 1963. (This only covered particular domestic and agricultural uses, including fish farming and flows to domestic amenity ponds).

main river – Some, but not all, watercourses are designed as 'Main River'. 'Main River' status of a watercourse must first be approved by MAFF. Statutory (legally binding) maps showing the exact length of 'Main River' are held by MAFF in London and the Environment Agency in Regional Offices. The Environment Agency has the power to carry out works to improve drainage or protect land and property against flooding on watercourses designated as 'Main River'. The Environment Agency does not have the legal power to spend public funds on drainage or flood protection works on watercourses not designated as 'Main River'.

natural area – The whole of England has been described as a series of ecologically distinct areas following survey work by English Nature.

nutrient – Conveying, serving as, or providing nourishment.

parr – Juvenile salmonids aged one year and older.

payback – The consultancy service of Groundwork Trust for Devon & Cornwall. They carry out waste audits for business.

permeability – A measure of the ease at which liquids (or gases) can pass through rocks or a layer of soil.

prescribed flow (pf) – Flow below which a river must not be reduced as a result of licensed abstraction.

redd – Hollow created in river bed gravels by spawning salmonid fish into which the female deposits ova.

riparian owner – Owner of riverbank and/or land adjacent to a river. Normally owns riverbed and rights to at least midline of channel.

river corridor – Land which has visual, physical or ecological links to a watercourse and which is dependent on the quality or level of the water within the channel.

salmonid – Game fish of the salmon family e.g. salmon, brown trout and sea trout.

smolts – Young salmonids migrating to sea for the first time and adapted to life in salt water.

special wastes – These are the most hazardous wastes, they include hazardous or toxic wastes. Some common special wastes are: acids, alkaline solutions, oil fly ash, industrial solvents, oily sludge, pesticides, pharmaceutical compounds, photographic chemicals, waste oils and wood preservatives.

MANAGEMENT AND CONTACTS:

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

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**ENVIRONMENT AGENCY
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0645 333 111

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

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