

# local environment agency plan

## FRESHWATER TAMAR AND TRIBUTARIES

CONSULTATION DRAFT

DECEMBER 1998



ENVIRONMENT  
AGENCY

## Your Views

This Consultation Draft Local Environment Agency Plan (LEAP) is our initial view of the issues facing South East Cornwall (Map 1 indicates the area covered by the plan). Public consultation allows people who live in or use the catchment to have a say in the development of our plans and work programmes. We welcome your ideas on our future management of this area:

- Have we identified all the issues?
- Have we identified all the options for solutions?
- Have you any comments on the issues and options listed?
- Do you have any other information or views that you wish to bring to our attention?

We look forward to hearing from you.

**Please send your comments by 18 March 1999, preferably by writing to:**

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Map 4 - Compliance with River Quality Objectives



### Map 5 - EC Directives Monitoring



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maps

## Foreword

This Draft Consultation has been put together to look at the environmental problems in the area and suggest actions that are necessary to tackle the problems that arise from the pressures on the environment, and to seek new opportunities to enhance it.

We would like to thank the Steering Group for their help in compiling this 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.



**GEOFF BOYD**  
Cornwall Area Manager



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## The Environment Agency

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, but no powers in, 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 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 consultation draft. Further detail on standards and compliance is available from the address given on the back of this document.

## 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.

## 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. In this document a number of proposed actions are presented for consultation with all who live, work and have an interest in the area.

## The LEAP Area - an 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.
- 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 Bronze Age onwards; including highly visible features such as hut circles, standing stones, reaves, field systems, hillforts.

The plan area is based on the river catchment of the Freshwater Tamar system draining from the Culm measures and the slopes of Dartmoor and Bodmin Moor to the tidal limit at Gunnislake. The total area of the catchment is 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 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 catchment, 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 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 both 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 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 366km of rivers in the Freshwater Tamar and Tributaries Catchment. In 1997, 73.3 per cent of monitored river lengths in the catchment 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 catchment where it is not good enough. These shortfalls in quality are described in this consultation report.

## A Better Environment Through Partnership

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 run-off, 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 consultation draft 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 covered by this document. 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.

**Biodiversity Action Plans** – Conservation of habitats and species is co-ordinated through the production of Biodiversity Action Plans (BAPs). 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 the document 'Cornwall's Biodiversity Volume 1: Audit and Priorities'. This was published in June 1997, and together with digitised habitat, species and land use data for the whole county it will be a powerful tool for use in drawing up priorities for action. The extent of loss of various habitats between 1988 and 1995 can be measured, as can the degree of threat to the remaining habitats.

The short-listed habitats and species action plans drawn up by expert focus groups were published in July 1998, including the action plans for the otter and for Bodmin Moor.

**LIFE Project** – New development 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 the Ministry of Agriculture, Fisheries and Food (MAFF), various Sites of Special Scientific Interest (SSSI) Management Agreements agreed with English Nature, as well as 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. The

Uplands Bodmin Moor pilot project, which is seeking European Union match funding, 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 10).

**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.

**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 are 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 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. Methods used to achieve these aims include a programme of riverside fencing in appropriate locations and improvements to obstacles to fish passage such as improvements to the pipe bridge at Panson Ford on the River Carey.

**Cornwall Waste Management Forum and Agency 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 organisation 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.

**Cornwall Air Quality Forum** – 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.

The Cornwall Air Quality Forum has been formed as one of 14 pilot areas nationwide. 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.

## Environmental Issues in the Area

### Issue 1 Meeting current and future water demand

Water is an essential but finite resource that needs careful management to ensure its availability. We are in a position to help develop public awareness of this issue and guide people towards a more sustainable use of water. Our duties and interests in water resources can be found in Appendix 1.

We have 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. Water resources development is planned over long time-scales to allow sufficient time to meet any forecasted potential supply demand imbalance.

At the water summit in May 1997 John Prescott announced his ten-point plan. Amongst the actions required as a result of this was a review of the water abstraction licensing legislation. The direction of changes proposed by the Department of the Environment Transport and the Regions (DETR) are set out in the DETR consultation paper 'The review of the Water Abstraction Licensing System in England & Wales' (June 1998). The full nature and impact of changes will not be clear until the final papers are approved by Parliament. We will need to implement any changes that arise from this process and amend licensing policies as appropriate.

**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.

Roadford reservoir has a gross storage of 37,000 Ml and under the current licence 81.5 Ml/day (29,747.5 Ml/year) can be taken to supply North Devon and 148 Ml/day can be released into the river for abstraction downstream at Gunnislake. A compensation flow of 9 Ml/day is also released into the River Wolf throughout the year. Water 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 SWWL 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 SWWL to undertake an environmental monitoring programme to allow the Agency to protect interests downstream and enhance the ecology of the watercourse.

In parallel with the current Third Periodic Review process by the water industry regulator OFWAT, 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 resource availability and a 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. The draft of SWWL's plan was submitted to the Agency in June 1998. A national review of all the draft plans will be published in October 1998. The Agency expects that SWWL will wish to make public the key aspects of their draft plan before completing the final plan in April 1999. We expect to publish our revised regional water resources strategy, covering all aspects of water resource use, during 2000 following the outcome of the OFWAT Periodic Review by the end of 1999.

In May 1998 the Agency published 'A Price Worth Paying' which set out the National Environmental Programme, the improvements in the environment that the Agency expects from the third periodic review.

**Meeting Future Demand** – The Agency has to be satisfied that the water companies 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 and customers can have their homes metered at subsidised prices should they opt to. People who have a garden sprinkler are asked to register it with the company on the understanding that they may be metered at a later date. The water companies have a duty to apply and demonstrate efficient use of water within the business and to its customers. In respect of this they have published water efficiency plans which contain strategies to deliver water saving by the customer. SWWL's plan includes advice on how to save water in the home and garden and explains what the company is doing to encourage other bodies, such as the local council and builders, to help the customer to save water. SWWL also has a free educational resource pack, *Running Water*, which provides National Curriculum support for 8 to 13 year olds.

More efficient management of existing resources can increase the quantity of water that is available. Both conjunctive use of sources and effective leakage control are key targets here. SWWL have set a public leakage target which equates to 15 per cent of overall leakage from company's pipes by the year 2000 and 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, low water use dishwashers and washing machines and the 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 32,000 gallons / 146,000 litres per year of water, 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.

The Agency is currently investigating the effectiveness and applicability of 'grey water'. The main factors being considered are the water-saving potential, water quality, customer acceptability and financial viability. A report on the trials will be published later this year. We support any safe and hygienic water-saving measures which do not have a harmful effect on the environment. We also support further research into innovative water-saving devices such as 'grey water' recycling which has the potential to save up to 30 per cent of the average domestic water consumption. This, and other demand management research, is carried out at our National Water Demand Management Centre.

**Operation of Roadford Reservoir** – Roadford reservoir is operated in conjunction with other sources to meet the public water supply needs of North Devon and parts of Cornwall. The impacts on flows in the River Wolf are mitigated by a 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 SWWL 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.

Action	Targets	Environmental benefits	Responsible body and partners
Revise the Regional Water Resources Development Strategy based on information received in the companies' water resources plans	During 2000	Balancing needs of users with the needs of the environment	Agency
Dissemination of information on demand management and water-saving measures in conjunction with the National Waste Survey	During 1998/1999	Balancing needs of users with the needs of the environment	Agency
Agree programme of use of the fisheries water bank	Ongoing	Maintain fishery and river ecology	Agency, SWWL, TTFA

Biodiversity simply means variety of life. Within the area covered by this report 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 achieve sustainable use of, and development within, the catchment, 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 Action Plans 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), 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 catchment. For a full description of habitats and species the full BAP documents should be consulted.

Table A : Table of Key habitats and species

Key habitats	Species	Status	Threats
<b>Boundary features</b> e.g. Cornish hedges, Ditches	Ferns, bryophytes, small mammals, reptiles	National priority	Removal, neglect, poor management
<b>Culm Grassland</b> e.g. Dunsdon Farm National Nature Reserve	Marsh fritillary, whorled caraway, wavy leafed St Johns wort, barn owl, curlew etc	Internationally important	Drainage, waste spreading, tipping, pond creation
<b>Freshwater areas</b> e.g. wetlands, ponds, rivers/streams	Otters, bullhead, salmon, native brown trout, sea trout, shad, lamprey, water vole, freshwater mussel, dragonflies e.g. Southern damselfly, lower plants	International priority	Nutrient enrichment, changes in land use, run off, water abstraction
<b>North Dartmoor</b>	Blanket bog, lower plants, invertebrates	Internationally important	Overgrazing
<b>Bodmin Moor</b>	Moorland species including golden plover	Nationally important	Recreation, stocking levels

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. 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 1960's and 1970's. 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 will be the subject of its own Species Action Plan. We have part funded a Wildlife Trust otter project officer in Cornwall who will promote otter conservation throughout the county.

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.

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.

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.

**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, SWWL, 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 county-wide 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.

**Culm grassland** – Culm grassland is a wet grassland habitat rich in rare species of flora and fauna. It 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.

**River Habitat Surveys** – River Habitat Surveys (RHS) assess the physical character and quality of river habitats. Their main purpose is to provide river managers with information needed to sustain and enhance biodiversity. Following a survey during 1994-97 throughout the UK, a representative sample of types of habitat features forms a baseline against which it can be assessed how rivers are measuring up to their potential. As part of our routine work we are undertaking surveys at selected sites throughout the area to increase the number of reference sites.

Action	Targets	Environmental benefits	Responsible body and partners
Promote eradication of invasive plant species e.g. Japanese Knotweed		Enhanced biodiversity	Knotweed group
Implement Bio-diversity Action Plans	In accordance with Cornwall Biodiversity Action Group Timetable	Enhanced biodiversity	Cornwall Biodiversity Initiative
Map extent of existing Culm grassland and identify sites for restoration		Enhancement of internationally important habitat	Agency, CWT, NCDC
Carry out River Habitat Survey	Sites prioritised where required	Provides data on habitat security and enables trends to be identified	Agency

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 catchment 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 which is needed to maintain healthy sustainable salmon fisheries .

The Agency is already undertaking action to protect and conserve salmon stocks through its national Salmon 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 could include a ban on fishing for part of the season, are being discussed in response to independent scientific advice on the state of salmon stocks internationally, given to the North Atlantic Salmon Conservation Association (NASCO) at its meeting in Edinburgh in June. This emphasised the decline in stocks throughout southern 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 (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 European Union, 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 is therefore seeking 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 & Wales. Options could include:-

- Delaying fishing seasons for net and rod fisheries for salmon until early summer
- Introducing mandatory catch and release for rod fisheries for the same period, together with method restrictions to reduce catch and limit damage to fish
- Introducing other stock protection measures later in the season, especially to protect larger salmon

After consulting its RFERACs, the Agency will discuss with MAFF and the Welsh Office what action is required. National byelaws could, for example, be proposed for 1999 which would require wider public consultation.

While we agree there is a national decline we are concerned that factors specific to the River Tamar are having a significant effect. These factors were assessed recently in a Salmon Action plan for the River Tamar, although there is still much investigative work that needs to be carried out by the Agency and other interested parties.

**Salmon Action Plan** – A Salmon Action Plan for the River Tamar was published by the Agency in September 1998 following extensive consultation with interested parties. The Salmon Action Plan is part of the National Salmon Management Strategy which has the following aims: safeguarding the salmon stocks, maximising economic/social benefits and ensuring long-term improvements. The plan describes the fishery and how it is performing, identifies the key issues in each river system, sets fishery targets and fishing effort controls and outlines a programme of improvements. Copies of the plan are available from our Bodmin office.

**Natural Predation** – Natural predation by birds and mammals occurs throughout the fishery. MAFF is currently carrying out a three-year study into the impact of fish-eating birds on freshwater fisheries. 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 until and unless 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 catchment 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. For example serious diseases can be spread to wild populations and predation by alien species can cause damage. We are also concerned about the potential impact of trout stocking on local 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 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.

**Effects of siltation** – We are concerned over the effects of silt on the fishery. Silt can come from many sources including agriculture. As a precautionary measure we need to identify and reduce silt inputs. We need to assess the impact on eggs and young fish. 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 agricultural 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 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.

**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 and 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.

Action	Targets	Environmental benefits	Responsible body and partners
Introduce byelaw / voluntary restrictions to protect and conserve salmon stocks Broker net buyback agreements	Ongoing	Fulfil potential of fishery	Agency, fishery owners and clubs, MAFF
Promote and support NASCO actions to minimise exploitation of salmon stocks in distant water fisheries	Ongoing	Fulfil potential of fishery	Agency, NASCO, MAFF, local fishery interests
Maximise habitats including: reducing silt inputs fencing project cleaning of spawning gravels assessing effectiveness of gravel rehabilitation	Ongoing	Maximise spawning areas	Agency, WCRT, Riparian owners
Investigate effects of stocking trout on native salmonids through an Agency Research & Development project.	Ongoing		Agency
Maximise use of resources to prevent poaching including collaborative work with other parties.	Ongoing		Agency, riparian owners, TTFA, general public
Appropriate removal of trash dams / instream obstructions	Ongoing	Allow migration and prevent siltation of spawning gravels	Agency, WCRT, riparian owners
Prepare a best practice protocol for instream structures positioning	Ongoing	Best position of the structures to prevent flooding	Agency & SWRA
Investigate causes of low juvenile populations including assessing effects of water quality, water resources and predation	When resources allow	Fulfil potential of fishery	Agency

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** – An investigation into the historic and current flow regimes relating to the use of the Tamar Lakes will clarify the impact of the lakes. Such investigation will need to 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 needs to 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. 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 both the Upper and Lower Tamar Lakes are thought to be 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 destratification of the water body and to make relevant Environmental Health authorities aware of possible health risks from recreation on the Upper Tamar Lake at times of algae blooms.

**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 both these stretches may be linked to effects of algal blooms moving downstream from the Tamar Lakes.

Action	Targets	Environmental benefits	Responsible body and partners
Investigate low flow concerns	Ongoing		Agency
Set up focus group to consider options for actions for future management of the Tamar Lakes including review of abstraction licence and proposals for restoration of Bude canal.	Ongoing	Improved riverine habitat	Agency, SWWL, NCDC, TTFA
Encourage use of buffer zones and source control in appropriate locations	Ongoing	Improved water quality and baseflow of watercourses	Agency, landowners
Carry out wet weather monitoring in Spring to assess nutrient input to the Tamar Lakes, particularly phosphorus.	Ongoing	Understanding of mechanisms leading to eutrophic conditions	Agency
Carry out planned additional monitoring to assess the nutrient loading within the Tamar Lakes including sediments.	Ongoing	Understanding of mechanisms leading to eutrophic conditions	Agency
Carry out monitoring throughout the catchment to identify effects attributable to algae including economic effects.	Ongoing	Quantify impacts of algal bloom on entire River Tamar catchment	Agency WCRT
Encourage reduction of nutrient inputs	Ongoing	Improve water quality	Agency / landowners/ SWWL
Investigate appropriateness of destratification methods	Ongoing	Improve water quality	Agency / SWWL

**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 to working in conjunction with industry, the emergency services and the public to minimise or eliminate pollution at source. The aim is that, through the promotion of advisory literature, regular inspection and promotional talks or seminars, the Agency wishes to show it is not just a regulator.

**Eclipse 1999** – Some concern has been voiced over the effects of the likely increase in visitors to see the eclipse in August 1999 on services in Cornwall. The Agency is working in conjunction with other bodies to minimise the effects of the large number of expected visitors on the infrastructure and the environment. The Agency are involved in the Waste and Water Quality Working Group. This group includes representatives from SWWL, County Environmental Services, District and County Councils and industry. The purpose of the group is to plan for impacts on the environment during the eclipse.

The effect on water resources will be transitory and the supply will be limited by the capacity of the water distribution system. In addition the Agency is expecting a large number of applications for private surface water or borehole abstractions. These proposals which will be handled using our normal procedures will need to meet the requirements of our current policies.

**Year 2000 - The Millennium 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.

Action	Targets	Environmental benefits	Responsible body and partners
Develop contingency plans to deal with potential increase in visitors during eclipse	By August 1999	Minimise effects on infrastructure and environment	All relevant Authorities
Promote education and campaigns to highlight pollution prevention measures throughout industry and at home.	Ongoing	Enhanced environmental protection	Agency

Agriculture covers the majority of the plan area, with mixed and dairy farming in the upper Tamar, moorland grazing on Dartmoor and Bodmin moor and mixed and dairy farming in the more sheltered areas towards the coast.

**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 2).

**Small Brook project** – The Agency has been working together with local farmers investigating links between farming activity and a 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 is producing an information leaflet with the assistance of local farmers and industry. The aim of the leaflet is to raise awareness and promote the findings of the recently completed water quality work done in the Small Brook catchment. It also discusses case studies and provides pollution statistics.

**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 comes 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.

Action	Targets	Environmental benefits	Responsible body and partners
Promote Code of Good Agricultural Practice for the Protection of Soil, particularly in conjunction with changes of land use and crop patterns	Prevention of soil erosion and land run off into watercourses	Improvement of water quality.	MAFF/Agency
Promote Small Brook leaflet	Prevention of pollution and education	Reduction of pollution incidents.	Agency, SWWL, local industry, landowners
Encourage permanent grassland swards beside rivers to stabilise soil	Prevention of soil erosion and land runoff into watercourses	Improvement of water quality.	Agency, landowners

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. Our duties and powers with regards to development are described in Appendix 1.

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 was acceptable we may 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 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 Department of the Environment, Transport and Regions (DETR); the key elements are that the Agency should:

- Take an 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 LEAP 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 the Agency are required by the DETR (in Circular 30/92 - Development and Flood Risk) to liaise closely on flooding and surface water run-off 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. This showed that at the current time no additional flood alleviation schemes are required in the plan area.

The Agency is encouraging the adoption of source control: the selective use of structures such as soakaways or swales as part of a development to promote infiltration of surface water run-off. These would help to replenish groundwater as well as reduce the erosion potential in watercourses; however their use must be site dependent.

**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. The conservation section sees all of the Agency’s capital works, maintenance works, licence and planning applications.

The Cornwall Wildlife Trust, through the ‘LIFE’ project, are mapping the levels of change in semi-natural habitats, and what has replaced them.

Action	Targets	Environmental benefits	Responsible body and partners
Plan development to prevent adverse effects on environment including increase in flooding risk	Ongoing	Towards sustainable development	Cornwall County Council / District Councils
Promote source control through increased awareness	Site specific details where appropriate	Enhancement of ecological qualities alongside flood prevention	Agency

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.

**Flood warning** – Leaflets are available showing where a flood warning service is provided. A region-wide study into the current flood warning level of service is due to be completed by the end of 1999. The results from this study will identify locations where a service can be introduced or improved. Any improvements will be prioritised taking into account the needs of the whole region.

**Maintenance** – Regular maintenance is essential if flood 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 annual cost of maintenance varies depending on need each year; it is generally in the order of £50,000. 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.

Action	Targets	Environmental benefits	Responsible body and partners
Determine future flood warning strategy and programme	Following level of service study	Towards sustainable development	Agency

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 the 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.

The Government has stated its intention to redefine mining/quarrying/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.

**Contaminated land** – New legislation on treatment of identified contaminated land will be in place by 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** – There have been failures of the EC Dangerous Substances Directive for copper in the Lower Tamar (see Appendix 2). Investigations carried out in 1995 indicated problems associated with abandoned mines in the vicinity of Hingston Quarry. Further investigations are required to take account of general drainage and unmonitored stretches of watercourses to identify the extent of inputs within the catchment area.

Action	Targets	Environmental benefits	Responsible body and partners
Minimise the effects of historic mining areas	The Agency seeks to minimise the effects of development on former mining sites via planning procedures	Towards sustainable development	Local planning authorities, Agency
Investigate historic mines drainage in vicinity of Hingston		Identify inputs responsible for Directive failures	Agency

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 Cornwall 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 the county councils' waste management strategies in their Waste Local Plans for Devon and Cornwall. The Environment Agency's forthcoming national survey of waste arisings will provide better data in future. The Agency is to prepare a Regional Waste Management Plan, based on the survey findings.

**Provision of waste facilities** – The county councils' Waste Local Plans will identify the criteria for the provision of sufficient and adequate facilities as guidance to potential operators and to direct planning policy. Specific proposals will then be vetted by the County Planning Authority in consultation with the Agency. Due to pressures on facilities including lack of landfill space Cornwall County Council has had to embark on the production of a local Waste Strategy for consultation, ahead of national and regional plans.

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. Firstly data on current requirements will be 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 started in October 1998. The survey will include visiting approximately seventy firms randomly selected from a central register. The survey will be completed by the end of March 1999.

**Cornwall Waste Management Forum and Agency waste minimisation promotions** – The Agency is a member of the Cornwall Waste Management Forum, a partnership with the six District Councils and the County Council, which works in collaboration with the Payback organisation in the setting up of Waste Minimisation Groups. Through our regular contact with businesses we are advising firms on their environmental management systems including waste minimisation. The Agency has produced a commercial recycling directory that will assist businesses in identifying recycling outlets for recoverable wastes. In time this will stimulate a need for new treatment and recovery facilities locally to provide a more sustainable alternative to just landfill disposal. These waste minimisation initiatives have enabled many companies to discover opportunities for cost savings whilst changing their approach to waste and other emissions.

**Waste to land** – Land is already used for spreading agricultural and some industrial wastes and sewage sludge, particularly in the area around the headwaters of the Rivers Inny, Ottery and Kensey and the Gunnislake area. Poor waste management can result in pollution incidents. Waste applied to existing semi-natural habitats may result in a loss of conservation value through the potential build-up of nutrients in the soil, in surface or groundwater and in the decline of semi-natural vegetation. Certain controlled wastes spread on land for agricultural benefit are exempt from a formal waste management licence.

This is an issue we feel needs reviewing in a comprehensive and integrated way to ensure that the activity does not cause undue impact. Such a review will involve landowners, spreaders, MAFF and other interested parties and will follow the production of new national guidelines to be produced later this year.

**Disposal of leachate from landfill sites** – Leachate from landfill sites can affect water quality and any discharge to a watercourse must be consented by the Agency. An application for consent to discharge leachate from Combebow landfill site has been refused by the Agency. The Agency and Devon Waste Management, the site operators, are working together to find the best environmental option for treatment.

The Agency is in discussion with Devon County Council with regard to the final restoration of Anvil Corner to ensure that it has no lasting effect. The Agency has requested that Devon County Council apply for a licence to keep and treat leachate on site at Anvil Corner.

**Sewage sludge disposal to land** – From 31st December 1998 the disposal of sewage sludges at sea will be prohibited by the EC Urban Waste Water Treatment Directive increasing disposal to land. Good management practices and the use of existing codes will mean this could benefit the land agriculturally; however there is a risk of pollution if care is not taken.

**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 is currently £7 per tonne for general waste and £2 per tonne for inert materials.

**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.

**Producer responsibility** – The Producer Responsibility Obligations (Packaging Waste) Regs.1997 have been compiled to ensure that the real environmental costs of producing, using and disposing of packaging falls directly on those who produce or use it. All businesses who 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.

Action	Targets	Environmental benefits	Responsible body and partners
Identify new waste management sites, through consultation, on Devon and Cornwall Waste Local Plans	Seek to ensure Agency interests are considered in Local Authority promotions	Sustainable waste management	County councils
Encourage good practice whilst waste spreading to land	Following national review of practices	Improvement of aesthetics & local environment Protection of Culm	Agency, spreaders, landowners, local authorities
Encourage recycling facilities	Seek to ensure Agency interests are considered in Local Authority promotions	Sustainable waste management	Local Authorities / Agency
Promote waste minimisation	Seek to ensure Agency interests are considered in Local Authority promotions	Sustainable waste management	Local Authorities / Agency
Find best environmental option for Combebow landfill site		Sustainable waste management	Agency, DWM
Determination of licence at Anvil Corner		Sustainable waste management	Agency
Campaign to highlight fly-tipping problems	Where opportunities arise	Improvement of aesthetics & local environment	Agency

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 catchment there are numerous sites where the Agency consents the discharge of effluent into surface 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 groups of them, and are set at levels needed to protect the environment from harm and to ensure compliance with River Quality Objectives (RQOs), EC Directives and International Conventions.

Diffuse sources of pollution such as agricultural run-off and urban/highway run-off have to be tackled using other regulatory powers.

**Sewage Treatment Improvement Plans** – Improvement plans for South West Water Services Limited (SWWL) discharges are subject to available funding. The water company's improvement plan known as Asset Management Plan 2 (AMP2) was developed based on guidelines agreed between the former NRA, the former Department of the Environment, the water services companies and OFWAT in 1994. AMP2 runs from 1995 to 2000. OFWAT has recently initiated a five-year review of water prices which will result in AMP3, running from 2000 to 2005. We are currently reviewing those discharges where improvements are required; any improvements will then be subject to available funding being approved. Those sewage treatment works (STWs) being considered for improvements in the AMP3 programme are listed in Appendix 2.

**Effluent Disposal Issues in the Freshwater Tamar and Tributaries Catchment** – Pyworthy STW caused RQO non-compliance in Derril Water (see Appendix 2). The current consents for Holsworthy, Lydford and Lewannick STWs will not protect the RQOs of the rivers to which the STWs discharge (see Appendix 2). We are currently seeking improvements to these STWs in AMP3; any improvements will be subject to funding being approved.

In addition, Lewannick STW requires improvements to meet the requirements of the UWWTD (see Appendix 2). We are currently seeking improvements to this STW in AMP3; any improvements will be subject to funding being approved.

Action	Targets	Environmental benefits	Responsible body and partners
Seek improvements to Pyworthy STW.	Complete by 2005, subject to approval of funding.	Protection of downstream RQO.	Agency/SWWL
Seek improvements to Holsworthy STW.	Complete by 2005, subject to approval of funding.	Protection of downstream RQO.	Agency/SWWL
See improvements to Lydford STW.	Complete by 2005, subject to approval of funding.	Protection of downstream RQO.	Agency/SWWL
See improvements to Lewannick STW.	Complete by 2005, subject to approval of funding.	Protection of downstream RQO.	Agency/SWWL
Improve Lewannick discharge to meet appropriate treatment level under the EC UWWTD.	Complete by 2005, subject to approval of funding.	Improved water quality.	SWWL

## Issue 12 Unknown causes of poor water quality

The stretch of the River Kensey from Truscott Bridge to Newport failed to comply with its RQO in 1997. This failure cannot be attributed to any known cause and thus investigations into possible causes of this non-compliance are taking place.

The River Thrushel from its source to Rivermead Bridge failed to comply with its RQO in 1997. The cause of this failure is unknown but may be associated with one of the largest starling roosts in northern Europe. Large amounts of sewage fungus are present at this location. Investigations into the non-compliance on this stretch are taking place.

Action	Targets	Environmental benefits	Responsible body and partners
Investigate cause of RQO non-compliance in the River Kensey	RQO compliance	Improvement of water quality	Agency
Investigate cause of RQO non-compliance in the River Thrushel	RQO compliance	Improvement of water quality	Agency

## 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 powers) in:	Partnership
<p><b>Water Resources</b></p> <p>The Agency has a duty to conserve, redistribute, augment and secure the proper use of water resources.</p>	<ul style="list-style-type: none"> <li>● Grant or vary water abstraction and impoundment licences on application.</li> <li>● Revoke or vary existing licences to reinstate flows or levels to surface waters or groundwater which have become depleted as a result of abstraction, and are subject to a liability for compensation.</li> <li>● 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.</li> <li>● Monitor and enforce abstraction and impoundment licence conditions.</li> </ul>	<ul style="list-style-type: none"> <li>● The more efficient use of water by water companies, developers, industry, agriculture and the public and the introduction of water-efficiency measures and suitable design and layout of the infrastructure.</li> </ul>	<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><b>Flood Defence</b></p> <p>The Agency has a duty to exercise general supervision over all matters relating to flood defence throughout each catchment.</p>	<ul style="list-style-type: none"> <li>● Control, through Land Drainage consents, 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).</li> <li>● Produce flood risk maps for all main rivers under S105 of Water Resources Act 1991.</li> <li>● Undertake works to main river using permissive powers.</li> <li>● Issue flood warnings relating to main river to the public, local authorities and the police.</li> <li>● Consent mineral workings within 16 metres of main river.</li> </ul>	<ul style="list-style-type: none"> <li>● 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.</li> <li>● Installation of surface water source-control measures e.g. flood attenuation structures.</li> <li>● Supervising the maintenance of ordinary watercourses which is a local authority remit, but may impact on main river.</li> <li>● Installation of buffer zones which reduce flood risk and have significant environmental benefits.</li> <li>● Urban and rural land use and measures that can reduce flood risk or the need for watercourse maintenance.</li> </ul>	<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. 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 powers) in:	Partnership
<p><b>Water Quality</b></p> <p>The Agency has a duty to monitor, protect, manage and, where possible, enhance the quality of all controlled waters including rivers, groundwaters, lakes, canals, estuaries and coastal waters through the prevention and control of pollution.</p>	<ul style="list-style-type: none"> <li>● Issue discharge consents to control pollution loads in controlled waters.</li> <li>● Regulate discharges to controlled waters in respect of water quality through the issue and enforcement of discharge consents.</li> <li>● Prosecute polluters and recover the costs of clean-up operations.</li> </ul>	<ul style="list-style-type: none"> <li>● The control of runoff from roads and highways. This is a Highway Agency duty.</li> <li>● The greater use of source-control measures to reduce pollution by surface-water runoff.</li> <li>● Prevention and education campaigns to reduce pollution incidents.</li> </ul>	<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><b>Air Quality</b></p> <p>The Agency has a duty to implement Part 1 of the Environment Protection Act 1990.</p>	<ul style="list-style-type: none"> <li>● Regulate the largest technically-complex and potentially most polluting prescribed industrial processes such as refineries, chemical works and power stations, including enforcement of, and guidance on, BATNEEC and BPEO.</li> <li>● Have regard to the Government's National Air Quality Strategy when setting standards for the releases to air from industrial processes.</li> </ul>	<ul style="list-style-type: none"> <li>● The vast number of smaller industrial processes which are controlled by local authorities.</li> <li>● Control over vehicular emissions and transport planning.</li> </ul>	<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.</p> <p>The Agency wishes to liaise with local authorities in the production of their Air Quality Management Plans. The Agency will advise on and contribute to the Government's National Air Quality Strategy.</p>
<p><b>Radioactive Substances</b></p> <p>The Agency has a duty under the Radioactive Substances Act 1993 to regulate the use of radioactive materials and the disposal of radioactive waste.</p>	<ul style="list-style-type: none"> <li>● To issue certificates to users of radioactive materials and disposers of radioactive waste, with an overall objective of protecting members of the public.</li> </ul>	<ul style="list-style-type: none"> <li>● The health effects of radiation.</li> </ul>	<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.</p> <p>The Agency will work with MAFF to ensure that the disposal of radioactive waste creates no unacceptable effects on the food chain.</p> <p>The Agency will work with the Nuclear Installations Inspectorate to ensure adequate protection of workers and the public at nuclear sites.</p> <p>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 powers) in:	Partnership
<p><b>Waste Management</b></p> <p>The Agency has a duty to regulate the management of waste, including the treatment, storage, transport and disposal of controlled waste, to prevent pollution of the environment, harm to public health or detriment to local amenities.</p>	<ul style="list-style-type: none"> <li>• Vary waste management licence conditions.</li> <li>• Suspend and revoke licences.</li> <li>• Investigate and prosecute illegal waste-management operations.</li> </ul>	<ul style="list-style-type: none"> <li>• The siting and granting of planning permission for waste management facilities. This is conducted by the waste industry and local planning authorities. The Agency, as a statutory consultee on planning applications, can advise on such matters.</li> </ul>	<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><b>Contaminated Land</b></p> <p>The Agency has a duty to develop an integrated approach to the prevention and control of land contamination, ensuring that remediation is proportionate to risks and cost-effective in terms of the economy and environment.</p>	<ul style="list-style-type: none"> <li>• Regulate the remediation of contaminated land designated as special sites.</li> <li>• Prevent future land contamination by means of its IPC, Water Quality and other statutory powers.</li> <li>• Report on the state of contaminated land.</li> </ul>	<ul style="list-style-type: none"> <li>• Securing with others, including local authorities, landowners and developers, the safe remediation of contaminated land.</li> </ul>	<p>The Agency supports land remediation and will promote this with developers and local authorities and other stakeholders.</p>
<p><b>Conservation</b></p> <p>The Agency will further conservation, wherever possible, when carrying out water-management functions; have regard to conservation when carrying out pollution-control functions; and promote the conservation of flora and fauna which are dependent on an aquatic environment.</p>	<ul style="list-style-type: none"> <li>• The Agency has no direct conservation powers, but uses its powers with regard to water management and pollution control to exploit opportunities for furthering and promoting conservation.</li> </ul>	<ul style="list-style-type: none"> <li>• The conservation impacts of new development. These are controlled by local planning authorities.</li> <li>• Protection of specific sites or species, which is a function of English Nature. The Agency does however, provide advice to local authorities and developers to protect the integrity of such sites or species.</li> <li>• Implementation of the UK Biodiversity Plan, for which it is the contact point for 12 species and one habitat.</li> </ul>	<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 powers) in:	Partnership
<p><b>Landscape</b></p> <p>The Agency will further landscape conservation and enhancement when carrying out water-management functions; have regard to the landscape when carrying out pollution-control functions; and promote the conservation and enhancement of the natural beauty of rivers and associated land.</p>	<ul style="list-style-type: none"> <li>• The Agency must further the conservation and enhancement of natural beauty when exercising its water-management powers and have regard to the landscape in exercising its pollution-control powers.</li> </ul>	<ul style="list-style-type: none"> <li>• The landscape impact of new development, particularly within river corridors. This is controlled by local planning authorities.</li> </ul>	<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><b>Archaeology</b></p> <p>The Agency has a duty to consider the impact of all of its regulatory, operational and advising activities upon archaeology and heritage, and implement mitigation and enhancement measures where appropriate.</p>	<ul style="list-style-type: none"> <li>• The Agency must promote its archaeological objectives through the exercise of its water-management and pollution-control powers and duties.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct protection or management of sites of archaeological or heritage interest. This is carried out by local planning authorities, County Archaeologists and English Heritage.</li> </ul>	<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><b>Fisheries</b></p> <p>The Agency has a duty to maintain, improve and develop salmon, trout, freshwater and eel fisheries.</p>	<ul style="list-style-type: none"> <li>• Regulate fisheries by a system of licensing.</li> <li>• Make and enforce fisheries byelaws to prevent illegal fishing.</li> <li>• Promote the free passage of fish and consent fish passes.</li> <li>• Monitor fisheries and enforce measures to prevent fish-entrainment in abstractions.</li> <li>• Promote its fisheries duty by means of land-drainage consents, water abstraction applications and discharge applications.</li> </ul>	<ul style="list-style-type: none"> <li>• The determination of planning applications which could affect fisheries.</li> </ul>	<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><b>Recreation</b></p> <p>The Agency has a duty to promote rivers and water space for recreational use.</p>	<ul style="list-style-type: none"> <li>• The Agency contributes towards its recreation duty through the exercise of its statutory powers and duties in water management.</li> </ul>	<ul style="list-style-type: none"> <li>• Promotion of water sports. This is carried out by the Sports Council and other sports bodies.</li> </ul>	<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 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:

PRIVATE 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. In the Freshwater Tamar and Tributaries catchment, pH is set aside for stretch 22, the Lyd from source to A386 Roadbridge Lydford.

The table below and Map 4 show where current water quality fails to meet its RQO. This assessment is based on three years of routine monitoring data from the Public Register collected between 1995 and 1997. We have shown failures to meet RQO as *significant* and *marginal* failures. Significant failures are those where we are 95% certain that the river stretch has failed to meet its RQO. Marginal failures are those where we are less certain (between 50% and 95%) that the stretch has failed to meet its RQO.

Of the 56 monitored river stretches (366 km) in the Freshwater Tamar and Tributaries Catchment there are 5 stretches (26.9 km) which significantly fail to meet their RQO, and 13 stretches (72.4 km of river) which marginally fail to meet their current RQO. We have also assessed whether river stretches meet their long term RQO. There is one stretch (0.4 km) which significantly fails to meet its long term RQO.

River	Stretch	RQO	LT RQO	RQO/LT RQO non-compliance and failing parameters	
Tamar	Source to Upper Tamar Lake inflow	2		Total Ammonia (significant) <sup>1</sup>	
	Lower Tamar Lake to Footbridge D/S Tamar Lakes	2		BOD (significant) <sup>1,2</sup>	
	Footbr D/S Tamar Lakes to Tamarstone Bridge	2		BOD (marginal) <sup>1,2</sup>	
	Tamarstone Bridge to Crowford Bridge	2		BOD (marginal) <sup>1,2</sup>	
	Crowford Bridge to Tamerton Bridge	2		BOD (significant) <sup>1,2</sup>	
	Tamerton Bridge to below Confluence with River Deer	2 (1998)		BOD (marginal) <sup>1,2</sup>	
	Below Confluence with River Deer to Boyton Bridge	2		BOD (marginal) <sup>1,2</sup>	
	Boyton Bridge to Netherbridge	2 (1998)		BOD (marginal) <sup>1,2</sup>	
	Netherbridge to Polson Bridge	2 (1998)		BOD (marginal) <sup>1,2</sup>	
	Polson Bridge to Greystone Bridge	2			
	Greystone Bridge to above Hingston Quarry	2			
	U/S Hingston Quarry to D/S Hingston Quarry	2			
	Below Hingston Quarry to Normal Tidal Limit	2			
	Inny	Source to U/S Davidstow Creamery	1 (1998)		BOD (marginal) <sup>3</sup>
		U/S Davidstow Creamery to St. Clether Bridge	1		
St. Clether Bridge to Two Bridges		1			
Two Bridges to Trecarrell Bridge		1			
Trecarrell Bridge to Tamar Confluence		1			
Penpont Water	Source to Trelyn Bridge	1			
	Trelyn Bridge to Inny Confluence	1			
Lowley Stream	Landlake Bridge to Tamar Confluence	1			
Lyd	Source to A386 Roadbridge Lydford	1			
	A386 Roadbridge Lydford to Greenlanes Bridge	2			
	Greenlanes Bridge to Tamar Confluence	2			
Thrushel	Source to Rivermead Bridge	2		BOD (marginal) <sup>4</sup>	
	Rivermead Bridge to Stowford Bridge	2 (1998)			
	Stowford Bridge to Lyd Confluence	2			
Wolf	Source to Roadford Reservoir inflow	2			
	Roadford Reservoir to Roadford New Bridge	2			
	Roadford New Bridge to Rexon Bridge	2			
	Rexon Bridge to Thrushel Confluence	2			
Quither Stream	Source to Lyd Confluence	1			
Lew (Tamar)	Source to Combebow Bridge	2			
	Combebow Bridge to Lyd Confluence	2	1		
Combebow Stream	Source to Combebow Bridge	2			
Kensey	Badharlick Bridge to Truscott Bridge	2			
	Truscott Bridge to Newport	1		BOD (marginal) <sup>4</sup>	
	Newport to Tamar Confluence	1			
Carey	Source to Ashmill Bridge	2			
	Ashmill Bridge to Boldford Bridge	2			
	Boldford Bridge to Tamar Confluence	2			

River	Stretch	RQO	LT RQO	RQO/LT RQO non-compliance and failing parameters
Ottery	Source to Trengune Bridge	2		
	Trengune Bridge to Canworthy Water Bridge	2		
	Canworthy Water Bridge to Hellescott Bridge	2		
	Hellescott Bridge to Tamar Confluence	2		
Bolesbridge Water	Source to Ottery Confluence	2 (1998)		BOD (significant) <sup>2</sup>
Caudworthy Water	Source to Ottery Confluence	2		
Canworthy Water	Source to Ottery Confluence	1		
Claw	Source to Claw Bridge	2		BOD (marginal) <sup>2</sup>
	Claw Bridge to Tamar Confluence	2		
Deer	Source to Rydon Bridge	2		BOD (marginal) <sup>5</sup>
	Rydon Bridge to Tamar Confluence	2		BOD (marginal) <sup>2,5</sup>
Colesmill Stream	U/S Holsworthy STW to Deer Confluence	3	2	BOD (marginal) [LT: BOD (significant)] <sup>2</sup>
Derril Water	Source to Tamar Confluence	2		BOD (significant) Total Ammonia (marginal) <sup>6</sup>
Small Stream (Tamar)	Source to Headon Bridge	2		
	Headon Bridge to Tamar Confluence	2		

## Notes

- 1 See Issue 4: Management of the Tamar Lakes and Upper Tamar River System.
- 2 See Issue 6: Effects of Farming and Forestry.
- 3 This failure was caused by trade effluent from Davidstow Creamery. Improvements at the creamery should ensure future compliance with the RQO and therefore this is not an issue.
- 4 See Issue 12: Unknown causes of poor water quality.
- 5 This failure was caused by a septic tank at an old people's home. The home has now been connected to a sewer and therefore this is not an issue.
- 6 See Issue 11: Effects of Effluent Discharges.

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 sections below.

**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.

Water	Stretch	Length km (*Area km <sup>2</sup> )	Compliance	Reasons 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	Greenlanes 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 <sub>2</sub> )	Caused by prevailing drought conditions which resulted in low flows. Not an issue.
Ottery	Canworthy Bridge to confluence with River Tamar	18.5	Compliant	
Claw	Tetcott to confluence with River Tamar	3.1	Non-compliant, 1995 (dissolved O <sub>2</sub> )	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 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 I 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 I substances	Compliant 1995, 1996, 1997.

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

**Monitoring Site**

Gunnislake gauging station downstream of discharge from Hingston Quarry

**Monitored substances**

Arsenic  
Chromium  
Copper  
Lead  
Nickel  
Zinc

**Non-compliant substances and reasons for failure**

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, and allows lower standards of treatment to less 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. Less sensitive areas or High Natural Dispersion Areas (HNDAs) are those estuarine or coastal waters which are naturally very dispersive. In these areas a lower level of sewage treatment may be permitted. However, dischargers must demonstrate that no harm will be caused to the environment by the lower 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** – Several sewage treatment works in the Freshwater Tamar and Tributaries catchment have been identified as requiring improvements under AMP3 (see issue 11); these are listed below, with the reasons why improvements are required. Any improvements will be subject to available funding being approved.

**STW**

Pyworthy  
Holsworthy (Derriton)  
Lydford  
Lewannick

**Improvement driver(s)**

Ensuring compliance with RQO.  
Ensuring compliance with RQO.  
Ensuring compliance with RQO.  
Meeting the requirements of the UWWTD and ensuring compliance with RQO.

## Appendix 3 The quality of Groundwaters

The Agency has a need to monitor the quality of groundwater through a number of responsibilities. These include our general duty to monitor pollution to controlled waters, and our responsibility to monitor under the Regulations which implement the EC Nitrate Directive (although the DETR has decided that for the time being the Directive sampling will all come from Water Company boreholes). At present we have no nationally agreed network for groundwater sampling, but studies have been carried out to say what the needs would be. The collection of groundwater quality data in the catchment is at present limited.

The effect of this lack of data is that the Agency is not able to comment authoritatively on the state of groundwater, or to note any significant trends in change in quality, which might indicate any adverse effects from human activity. It is proposed to begin development of a more rigorous monitoring network, based where possible on existing supply boreholes, in line with the recommendations made by the British Geological Survey in 1994.

A revised version of the Agency's Policy and Practice for the Protection of Groundwater has recently been published.

### Abbreviations

AMP	Asset Management Plan
BAP	Biodiversity Action Plan
BATNEEC	Best Available Technique Not Entailing Excessive Cost
BPEO	Best Practical Environment 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
EQS	Environmental Quality Standard
EU	European Union
FWAG	Farming and Wildlife Advisory Group
GIS	Geographical Information System
HNDA	High Natural 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
SWWL	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 the 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, it may be solid or liquid. It does not have to be hazardous or toxic.

**Cornwall waste management forum** – the Forum consists of representatives from the six District Councils, as the waste collection authorities, the County Council, as the waste disposal authority and planning authority, the County Council's waste disposal contractor, and the Agency.

**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 subdivided into 'Ordinary' and 'Emergency' Drought Orders. A Drought Order could contain provisions 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; allow the prohibition of use of water for particular purposes; allow a ban on non-essential the use of water (for example in car-washes) or 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 run-off 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 20m<sup>3</sup>/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 the 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.

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

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

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

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