

# THE HARTLAND STREAMS CATCHMENT MANAGEMENT PLAN ACTION PLAN



**NRA**

*National Rivers Authority  
South Western Region  
March 1996*

Telephone the emergency hotline to report all environmental incidents, such as pollution, poaching and flooding, or any signs of damage or danger to our rivers, lakes and coastal waters. Your prompt action will help the NRA to protect water, wildlife, people and property.

NRA Emergency Hotline

0800 80 70 60



Further copies of this Action Plan can be obtained from

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The NRA and the Environment Agency

*The NRA will form the major part of a new organization which will have responsibilities for the environmental protection of water, land and air. The new Environment Agency starts its work of managing the environment in England and Wales on 1 April 1996.*



Awarded for excellence

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## CATCHMENT VISION

The area of North Devon covered by this plan includes the historic villages of Hartland and Clovelly, and is famed for its rugged and spectacular coastline.

Although only a small area, the importance of this catchment lies in its special habitats and landscapes; many are formally protected.

The entire catchment lies within the North Devon Area of Outstanding Natural Beauty and also includes the Hartland Heritage Coast. This coastline is dramatic with spectacular cliffs and waterfalls. Inland the area is characterized by steep sided valleys, some of which contain ancient woodlands, which are designated as Sites of Special Scientific Interest.

With the coast path, popular villages and beautiful scenery, this catchment receives many visitors who contribute towards the rural economy.

Our vision of the Hartland Streams Catchment is of a healthy and diverse water environment, managed in an environmentally sustainable way, balancing the needs of all users.

In an area of such high amenity and ecological value as the Hartland Streams our vision for the future is of a catchment where there is:

- \* achievement of environmentally sustainable use of the water resource
- \* maintenance and, where appropriate, enhancement of the biodiversity of aquatic and wetland habitats and species
- \* conservation and, where appropriate, enhancement of the natural and semi-natural ecosystems through improvements to degraded aquatic and water fringe habitats
- \* conservation of features of archaeological and historic interest within the aquatic and wetland environment
- \* continuing improvement to existing discharges to meet the most appropriate standards
- \* development of an agricultural and forestry system which reduces the risk of diffuse pollution and improves the physical habitat of the river system and wetlands for wildlife
- \* increasing enjoyment and appreciation of the water environment
- \* minimal risk to people and property from flooding
- \* minimal interference to the natural hydrological cycle, including natural river and wetland functions and processes.

## INTRODUCTION

Following production of the Hartland Streams Catchment Management Plan Consultation Report (Ref. 1) and the consultation period, we are now presenting the Hartland Streams Catchment Management Plan Action Plan. The Action Plan will form the basis for improvements to the water environment and primarily covers the five year period from 1996 to April 2000. Achievement of the Action Plan will be monitored and reported annually.

The Catchment Management Planning process within the NRA includes the production of two documents - a Consultation Report and an Action Plan. The Consultation Report describes our vision for each catchment, identifies problems and acts as a focus for consultation between the NRA and other interested parties in the catchment. The Action Plan identifies actions, following consultation, to resolve the problems and issues. The Plan provides background data for NRA responses to development plans and highlights our concerns about development.

## PUBLIC CONSULTATION

The issues listed in this Action Plan were identified in the Consultation Report. The Consultation Report was published in June 1995 and distributed to industry, local authorities, environmental groups, farming interests, sport and recreation groups and the public. A two month consultation period followed and an exhibition about the plan was displayed at Hartland, Clovelly and Bideford.

Twenty-four written responses were received (see Appendix 1). In addition, considerable interest was shown by the community in Hartland.

All of these responses received have been considered and have provided an invaluable contribution to the formulation of the Action Plan. A more detailed report on the public consultation is contained in Appendix 2.

## THE HARTLAND STREAMS CATCHMENT

The Hartland Streams Catchment is a group of catchments that drain to the North Devon coast between Welcombe and Abbotsham. These streams drain an area of approximately 74 km<sup>2</sup> and include the subcatchments of the Clovelly Stream, Abbey River, Speke's Mill Stream and Welcombe Stream. The longest river is the Abbey River which is 9.5 km long.

The Hartland Streams Catchment is underlain by rocks of the Upper Carboniferous Period locally known as the 'Culm'. The Upper Carboniferous strata is a minor aquifer although groundwater within these rocks does provide a large number of private supplies from wells, springs and boreholes. The water from some borehole sources contains elevated levels of iron and manganese, requiring treatment prior to drinking. Groundwater also provides limited base flow to streams and rivers within the catchment and supports flows during summer months.

The Culm soils are either heavy, poorly drained and difficult clay soils derived from weathered shales or shallow, stony, agriculturally poor soils derived from weathered sandstone. These soils support Culm grassland; a complex of wetland plant and animal communities of international importance.

The Abbey River and the other coastal streams in the catchment have similar hydrological characteristics; they are steep, fast flowing and rise and fall sharply after rain or during droughts. The streams have adapted to this relatively flashy response by developing a network of steeply sloping straight channels. Many mills have been built using water for power on several streams including Buck's Mills and Speke's Mill.

During the summer, stream flows decline quickly. In recent droughts flow in the Abbey River near Hartland village has fallen below 0.010 m<sup>3</sup>/s.

This is a sparsely populated and rural catchment with isolated farmsteads and villages. The main settlements are Hartland, Clovelly and Buck's Cross. The population is generally thought to increase by a third in Devon in summer.

Agriculture is the main industry, principally specialist dairy farming. Tourism is also important to the area; the dramatic coastline and historic villages, such as Clovelly, attract thousands of visitors a year. The South West Coast Path runs the entire length of the catchment providing easy access to this area for walkers. The A39(T) marks the southern edge of the catchment.

Our duties also cover Lundy Island off the Hartland Coast. Lundy is owned by the National Trust and run by the Landmark Trust under a 60 year lease, which runs from 1964. The island is within Torridge District Council's administrative area and has a small resident community. Lundy is renowned for its wildlife, landscape and history: part of the island is a Site of Special Scientific Interest; the whole is a Nature Conservation Zone and Heritage Coast, and is surrounded by Britain's only designated Marine Nature Reserve. Using the Lundy Strategy, a partnership document produced by Torridge District Council, we will review our activities on the island and assess the need for

any actions to be included in this Action Plan. We will include any appropriate actions for Lundy in the first Annual Review of this Plan.

## FUTURE REVIEW AND MONITORING PROGRAMMES

The NRA is responsible, with other identified organizations and individuals, for implementing this Action Plan. Implementing and reviewing these actions will enable the issues identified in this Action Plan to be resolved and move us closer to our vision for the Hartland Streams Catchment.

Annual reviews will be produced to report on progress to the Catchment Steering Group for the River Torridge. This group has been formed by the NRA from those interested individuals and groups who responded during the consultation period according to an agreed national format within the NRA. A copy of the report will also be available to all interested parties. These annual reports will examine the need to update the Consultation Report in the light of changes in the area. The period between major reviews will normally be five years.

The River Torridge Catchment Steering Group will monitor progress with this Action Plan. We will publish Annual Reviews for this group and other interested parties. The Catchment Steering Group represents a range of commercial, local authority and environmental interests. However, we continue to welcome comments on these reviews from other interested parties.

## ACTIVITY TABLES

The following tables outline the actions which are needed to address the issues we identified in the Consultation Report together with additional issues raised during the consultation process.

The following points should be noted:

- Our everyday work also commits substantial resources to managing the water environment. The scope of this work was explained in the Consultation Report.
- The costs identified represent the planned timetable of expenditure over the next five years. However, NRA policy and priorities may change in this time which may affect how much we are able to spend on specific issues.
- The financial years covered by this plan are represented by a single year, for example, '96' is the financial year April 1996 to April 1997.



## 1. RISK OF FLOODING

We aim to provide effective defence for people and property against flooding from rivers and sea and to provide adequate arrangements for flood forecasting and warning. We take account of economic and environmental considerations when assessing flood defence operations.

All rivers are classified as either *main river* or *ordinary watercourse* (sometimes referred to as 'non-main river'). We supervise all flood defence matters but have special powers to carry out or control work on main rivers and sea defences. Local authorities are responsible for flood defence on non-main rivers and protecting the coast from erosion by the sea.

We do not issue any flood warnings within this catchment as there is no 'main' river.

Proposals for sea defence works should be considered within an overall context that takes account of coastal processes and

ecological and conservation status. The Shoreline Management Plans being progressed will provide this context.

The design of all new tidal schemes allows for a predicted rise in sea level due to global warming of 5 mm a year.

A system has been set up to audit land drainage consent proposals in order to check consent compliance. We will continue to enforce these proposals.

We can build new flood defences where flooding is a serious problem in a particular area. Nowadays we usually only build new defences to protect built-up areas from flooding. All schemes must be technically, economically and environmentally sound. An environmental assessment is carried out for all new schemes. The scale of the flooding problems at Hartland and Lymebridge will be reviewed and, if a high priority, they will be added to our list of ongoing and proposed schemes.

Issues	Actions	Action By Lead (Other)	Cost to NRA £	Financial Year				
				96	97	98	99	2000
<b>1. Risk of Flooding</b>								
Proposals for coastal defence works need to be considered within an overall and integrated strategy	1a • Complete and agree 'Shoreline Management Plan' for the coastal cell - Bridgwater and Bideford Bay.	NRA, EN, SCC, ACC, DCC, WDC, SDC, WSDC, TDC, NDDC, MAFF	27,000	●	●			
Need to identify flood risk for planning authorities	1b • Complete and agree 'Shoreline Management Plan' for the coastal cell - Land's End to Hartland.	NCDC, BofR, CDC, PDC, KDC, CCC, MAFF, EN, NRA	Unknown at present	●	●	●		
	1c • Identify flood risk for the Hartland Streams Catchment according to national guidelines (programme due for completion by 1999).	NRA	25,000 <sup>1</sup>	●				
Inappropriate development, may affect standards of flood defence and damage environmental interest	1d • Advise planning authorities to ensure that all surface water runoff from new development in Hartland is discharged directly to the Abbey River and not to minor watercourses.	NRA TDC	Unknown	●	●	●	●	●
Flood problems identified at two locations	1e • Review flood problems at Hartland and Lymebridge.	NRA	< 1,000		●			

<sup>1</sup> Subject to review and approval by Flood Defence Committees. The cost is Regional and not catchment based.

## 2. NEED TO CONSIDER LANDSCAPE AND ARCHAEOLOGY

The Hartland Streams Catchment is important both for its dramatic landscape and as an area of considerable archaeological and historic interest. Almost the entire catchment carries landscape designations including the Area of Outstanding Natural Beauty and the Hartland Heritage Coast designation. Heritage Coasts represent the finest undeveloped coast in the country.

The prime responsibility for the protection of the landscape rests with other agencies; however, we will support relevant initiatives by others. When planning NRA operations we will carry out a

river landscape assessment in conjunction with our river corridor survey, to ensure our own activities do not harm, but rather where possible, enhance the landscape.

During NRA works we shall ensure that historic sites are protected and when we regulate the work of others we will encourage them to do the same.

In addition to the action (2b) we are also reviewing our consultation procedures. We have set up a pilot project with the County Archaeologist to improve our screening of land drainage consents.

Issues	Actions	Action By Lead (Other)	Cost to NRA £	Financial Year				
				96	97	98	99	2000
<b>2. Need to Consider Landscape and Archaeology</b>								
Need to improve awareness of importance of landscape	2a • Consult with others to explore need to raise awareness.	NRA CoCo, DCC, TDC, EN	<1,000	●				
Need for a simple assessment of the overall archaeological value of the catchment for considering actions in relation to the historic river environment	2b • Collaborate with County Archaeologist and other interested parties to produce document covering whole area.	DCC Archaeologist EH, DAS, NRA	1,500	●	●			

## 3. DETRIMENTAL EFFECTS OF FARMING

The majority of pollution incidents reported in this catchment were related to farming. We have now visited all farms and highlighted pollution risks. Careful management of farm wastes will reduce the risk to the water environment. Runoff from poorly-managed low-rate spray irrigation of farm waste is one of the major pollution risks in the catchment.

We shall continue to enforce farm waste legislation and secure improvements in farm waste management practices as necessary in line with our policy and the Code of Good Agricultural Practice (Ref. 2).

Farm waste management plans are a useful method of minimizing the risk of pollution from land runoff. However, we do not regard this catchment as a priority for a target area.

We shall encourage farmers to take advantage of the free pollution advisory visits that are available from ADAS on behalf of the Ministry of Agriculture, Fisheries & Food (MAFF). Schemes, such as Countryside Stewardship, which promote less intensive land management especially within the river corridor, will also reduce the risk of pollution.

The area is noted for the occurrence of a particular type of species-rich grassland which is confined almost exclusively to

this part of Britain, known locally as Culm grassland. This habitat comprises a characteristic mixture of marshy grassland, bog, wet heath and scrubby woodland which supports a wide range of flora and fauna, including a number of species which are declining or are nationally rare, such as the marsh fritillary. The Culm Measures support a greater concentration of this habitat than anywhere else in the country, making the Culm grasslands arguably the most important wildlife habitat in Devon and one which is of national significance.

Draining the land to support more intensive agriculture has led to a loss in Culm grassland.

Culm grassland is a priority area for Countryside Stewardship and the Wildlife Enhancement Schemes in Devon. Eighty-four Countryside Stewardship agreements now cover nearly 785 ha and other designations covering a further 52 ha on five sites; this represents about 50% of the known area of habitat (not all of which is in the catchment) (Ref. 3). We shall continue to support and promote these and other similar schemes.

We shall continue to encourage wetland restoration or creation when consenting or advising on development proposals or other activities which affect the water environment.



Issues	Actions	Action By Lead (Other)	Cost to NRA £	Financial Year				
				96	97	98	99	2000
<b>3. Detrimental Effects of Farming</b>								
Farm-related pollution incidents	3a • Complete planned task force investigations.	NRA	Completed					
Loss of semi-natural habitats, especially Culm grassland	3b • Co-operate with other conservation bodies to set and implement targets and action plans for restoration/rehabilitation of Culm grassland.	NRA, DWT EN, DCC, RHIER, HCS	Unknown	●	●	●	●	●
Decline of marsh fritillary	3c • Promote habitat conservation and implement targets when set.	NRA, DWT EN, DCC, RHIER, HCS	Unknown	●	●	●	●	●

#### 4. LOW FLOWS AND IMPEDED FISH PASSAGE IN SPEKE'S MILL STREAM

Overall the catchment is not stressed by abstraction. There is, however, one problem area in the Hartland Streams Catchment at Docton Mill, Lymebridge on the Speke's Mill Stream.

The stream is dry most summers where water is diverted along a leat which supplies Docton Mill. This abstraction is currently unlicensed. This site was ranked as 'minor' in its regional significance in a regional low flows study (Ref. 4). We are

working with the owners to identify a practical solution which takes full account of the abstractor's rights.

The absence of migratory salmonids in the area reduces the significance of obstructions in the rivers since they will only influence the movement of brown trout. In most cases, these fish will have no difficulty in gaining access to gravels on which to spawn. However, Docton Mill Weir prevents brown trout which have dropped below the weir from gaining access to the more suitable spawning areas further upstream in all but the highest flows.

Issues	Actions	Action By Lead (Other)	Cost to NRA £	Financial Year				
				96	97	98	99	2000
<b>4. Low Flows and Impeded Fish Passage in Speke's Mill Stream</b>								
Low flows in Speke's Mill Stream at Docton Mill	4a • License current abstraction and seek to impose environmentally protective conditions on licence.	NRA	1,000	●				
	4b • Install abstraction measurement method.	Owner NRA	<1,000 and cost to owner	●				
	4c • Calibrate abstraction measuring equipment.	NRA Owner	1,000	●	●			
Impeded fish passage at Docton Mill Weir	4d • Advise on weir modifications to permit fish passage as part of licence discussions.	NRA Owner	<1,000	●				
	4e • Modify weir.	Owner	Cost to owner	●	●			



## 5. LACK OF INFORMATION ON WILDLIFE AND HABITATS

Despite its small size the catchment is important for wildlife and includes four Sites of Special Scientific Interest (SSSI) and four nature reserves. The catchment includes species and habitats of interest including Culm grassland (see issues), otters, vegetated sea cliffs and ancient woodlands with a rich flora of lower plants, especially lichens.

We shall continue to maintain and develop links with other environmental organizations in order to monitor and research areas of conservation interest and share data. With this aim we contributed to the North Devon Wildlife Survey carried out by Devon Wildlife Trust.

We support and will request to share the data on marsh fritillary and other species collected by the regular surveys carried out by the north-west coastal branch of Devon Wildlife Trust.

The current programme of monitoring invasive bankside plants will help us to evaluate the extent of this problem in the catchment. When we have better data on the extent of cover the need for control can be assessed. We will promote our booklet 'Guidance for the Control of Invasive Plants near Watercourses' (Ref. 5) to riparian owners who have identified a problem with Japanese knotweed, giant hogweed or Himalayan balsam.

Issues	Actions	Action By Lead (Other)	Cost to NRA £	Financial Year				
				96	97	98	99	2000
<b>5. Lack of Information on Wildlife and Habitats</b>								
Need for improved understanding of streamside plant communities	5a • Investigate the need for surveys of ferns, lichens, mosses and liverworts.	NRA EN, DWT, DCC	Unknown	●	●	●	●	●
Lack of full information on otter distribution	5b • Promote otter surveys by local volunteer groups and NRA wardens.	DWT NRA HCS	<1,000pa	●				
Need for better understanding of distribution of invasive bankside plants	5c • Promote control by landowners.	NRA	<1,000pa	●	●	●	●	●
	5d • Survey invasive bankside plants.	NRA	<1,000pa	●	●	●	●	●
Need for identification of sites of nature conservation importance in Torridge District to improve protection	5e • Support appropriate wildlife surveys and inventory for Torridge District.	NRA, TDC NRA, DWT, EN, DCC	Unknown	●	●			
Need for clear biodiversity targets for rivers and wetland wildlife conservation	5f • Co-operate through Rivers and Wetlands Project in setting targets.	DWT EN, NRA, DCC, RHIER	Unknown	●				
	5g • Adopt biodiversity targets.	DWT EN, NRA, DCC, RHIER	Unknown	●				
	5h • Implement action plans where appropriate for key riverine and wetland species and habitats, e.g. Culm grassland and otters.	DWT NRA, EN, DCC, RHIER	Unknown	●	●	●	●	●

## 6. RECREATION

The spectacular scenery of the area is enjoyed by many visitors. The South West Coast Path and other footpaths in the catchment are popular. However, public access to rivers is limited and their small steep nature precludes canoeing. The coast is used by some for surfing, swimming and canoeing.

We shall continue to work with planning authorities to promote the appropriate recreation use of inland and coastal waters taking into account the needs of the disabled. We will continue to

monitor the level and type of recreation use of the catchment and we will collaborate with others, particularly the Heritage Coast Service to share survey data.

Whilst we wish to promote safe recreation use of the water environment, we also recognize the potential for conflict with conservation interests. We shall carefully consider and balance the requirements of both.

Issues	Actions	Action By Lead (Other)	Cost to NRA £	Financial Year					
				96	97	98	99	2000	
<b>6. Recreation</b>									
Restricted public access to watercourses	6a	<ul style="list-style-type: none"> <li>Promote access improvements at Buck's Mills Wood.</li> </ul>	Heritage Coast Service NRA, TDC, DCC, DWT	<1,000	●				
	6b	<ul style="list-style-type: none"> <li>Investigate the development of recreation routes connected to the water environment that link to other areas, e.g. Tamar Lakes.</li> </ul>	Heritage Coast Service NRA, TDC, DCC, Landowners	<1,000	●				
Lack of comprehensive data on recreation use	6c	<ul style="list-style-type: none"> <li>Set up a link with Heritage Coast Service to share survey data.</li> </ul>	NRA	<1,000	●	●	●	●	●



**Responses Received Through Consultation**

**National Organizations**

Forest Enterprise  
English Heritage  
Countryside Commission  
Ministry of Agriculture, Fisheries and Food  
English Nature  
National Farmers Union  
British Trust for Ornithology  
British Bryological Society

**Regional and Local Organizations**

Devon Wildlife Trust  
South West Water Services Limited  
Hartland Heritage Coast Service  
Devon Archaeological Society  
Halsannery Field Centre  
The Big Sheep  
The Yarner Trust  
Torrige Environmental Forum

**Local Authorities**

Torrige District Council  
Devon County Council  
Hartland Parish Council

Two written responses were also received from members of the public. Other comments were received at the display in Hartland.

## Report on Public Consultation

We received 24 written responses to the Consultation Report. Some of the comments and concerns of consultees are summarized here.

### 1 Wildlife and Landscape

Many of the people who commented on the plan welcomed our emphasis on protecting the natural environment.

The steep gradients and shaded character of many of the streams makes them ideal for mosses, ferns and liverworts. Relatively little is known about the distribution of these plants. A number of consultees supported our suggestion that these species should be surveyed.

Culm grasslands were once widespread in the catchment; the remaining areas are vulnerable to continuing pressures from intensive agriculture. Some consultees highlighted the international importance of Culm grassland habitat and illustrated a number of initiatives that should help to safeguard this habitat for the future. One consultee asked if we might encourage the reinstatement of Culm grassland if modern plantation forests are due for clear felling.

The need for clear biodiversity targets was picked up by some consultees. English Nature, the Government's advisor on nature conservation, encouraged us to adopt biodiversity targets in Catchment Management Plans as soon as they are available.

#### **Our comments:**

*The Rivers and Wetlands Project in Devon will generate species and habitat targets which may be adopted as Biodiversity Targets for part of our region. We support the work of the project and will adopt targets for the conservation of wetland species and habitats when they are available. We may be able to jointly sponsor some surveys such as work on mosses, ferns and liverworts. The reinstatement of Culm grassland sites will be included in the Rivers and Wetlands Strategy soon to be published. Any sites which are now wooded and are due for felling would be of high priority and we would support their reinstatement.*

*Wherever we regulate or comment on developments which affect wetlands - such as Culm grasslands - we do what we can to safeguard the wildlife interest of these sites.*

## 2 The Quality of Bathing Water

Some consultees were concerned that we no longer monitor the quality of some bathing beaches. These beaches, although popular, are not identified under the EC Bathing Waters Directive (76/160/EEC). Concern was also expressed over the river water quality of Buck's Mills Stream.

#### **Our comments:**

*We are responsible for monitoring the quality of identified bathing waters and providing the results to DoE who decide whether the standards in the Directive have been met. Local authorities identify bathing waters to DoE. There is one identified bathing beach in the Hartland Streams Catchment - Hartland Quay Beach.*

*Local authorities may choose to monitor the quality of water in coastal areas which are not identified as bathing waters. We may do this sampling work on their behalf but we must charge for this service. There are five popular beaches in the catchment which have not been identified under this directive - Welcombe Mouth; Shipload Bay; Clovelly Bay; Buck's Mills Beach; Portledge Beach. Torridge District Council currently monitor bathing water quality (total coliforms and *Escherichia coli*) at Welcombe Mouth, Hartland Quay, Clovelly Bay and Buck's Mills on a monthly basis. In addition, we are taking some river water samples to assess water quality in Buck's Mills Stream.*

## 3 Access to the Countryside

The Hartland Streams Catchment lies within the North Devon Area of Outstanding Natural Beauty and includes the Hartland Heritage Coast. The South West Coast Path - a National Trail - runs the entire length of the coast. Many people, including students on field studies, use this path or visit the wider area of the catchment.

Some consultees highlighted the recreation value of the catchment and encouraged us to do all that we could to promote water based recreation and access to the coast, especially linking existing recreation routes.

#### **Our comments:**

*We wish to develop the amenity and recreation potential of inland and coastal waters and associated land. However, we must always safeguard the environment from the damage that people can cause.*

*We will continue to work with the lead countryside agencies in this catchment to develop or improve river and coastal access in sympathy with other uses.*



#### 4 Archaeology

A number of consultees urged us to set up further consultation with archaeological experts in Devon and expressed support for a rapid appraisal of the catchment.

##### **Our comments:**

*We will progress the rapid archaeological appraisal as part of the Action Plan and we are also reviewing our consultation procedures. We have set up a pilot project with the County Archaeologist to improve our screening of land drainage consents.*

#### 5 Agriculture

One consultee felt that some of the land use data was inaccurate as some land is suitable for growing crops. It was also felt that we had encouraged the use of low-rate irrigation which now causes some pollution. Another consultee was disappointed that we did not acknowledge that farmers had spent considerable money to improve their farm waste management practices. One consultee questioned a statement that we made in the Consultation Report, that the intensification of agriculture in some locations has caused low river flows.

##### **Our comments:**

*MAFF kindly supply us with land use data and farming statistics. These data are gathered on a parish basis and the parish boundaries do not match those of the catchment so inaccuracies may result in the end figures especially with a small catchment that covers only part of several parishes.*

*We acknowledge the considerable investment made by farmers to improve water quality. We recommend low-rate irrigation as a method to deal with farm wastes. Low-rate irrigation systems need to be carefully managed so that they do not cause pollution.*

*The intensification of agriculture with extensive land drainage practices and greater abstraction will influence the flow regime of rivers.*

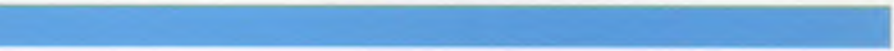
## River Quality Objectives (River Ecosystem Classification) and Compliance



Information correct as of March 1995

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**River Ecosystem Use Classes**

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 high class coarse fish populations
RE5	Water of poor quality which is likely to limit coarse fish populations

**Key**






-  Compliant With Proposed RQO
-  Not Monitored
-  Monitoring Point
-  Catchment Area
-  Settlement

Table 2: Standards for the Five River Ecosystem Use Classes

Use Class	DO % sat 10%ile	BOD (ATU) mg/l 90%ile	Total Ammonia mgN/l 90%ile	Un-ionized Ammonia mgN/l 95%ile	pH 5%ile & 95%ile
1	80	2.5	0.25	0.021	6.0 - 9.0
2	70	4.0	0.6	0.021	6.0 - 9.0
3	60	6.0	1.3	0.021	6.0 - 9.0
4	50	8.0	2.5	-	6.0 - 9.0
5	20	15.0	9.0	-	-



Class	Hardness mg/l CaCO <sub>3</sub>	Dissolved Copper µg/l 95%ile	Total Zinc µg/l 95%ile	Class Description
Very Good	≤10	5	30	Water of very good quality suitable for all fish species
	>10 and ≤50	22	200	
	>50 and ≤100	40	300	
	>100	112	500	
Good	≤10	5	30	Water of good quality suitable for all fish species
	>10 and ≤50	22	200	
	>50 and ≤100	40	300	
	>100	112	500	
Fair	≤10	5	300	Water of fair quality suitable for high class coarse fish populations
	>10 and ≤50	22	700	
	>50 and ≤100	40	1,000	
	>100	112	2,000	
Fair	≤10	5	300	Water of fair quality suitable for coarse fish populations
	>10 and ≤50	22	700	
	>50 and ≤100	40	1,000	
	>100	112	2,000	
Poor	≤10	5	300	Water of poor quality which is likely to limit coarse fish populations
	>10 and ≤50	22	700	
	>50 and ≤100	40	1,000	
	>100	112	2,000	

**Aquifer**

A sub-surface zone or formation of rock which contains exploitable resources of groundwater.

**Area of Outstanding Natural Beauty**

An area designated by the Countryside Commission to conserve and enhance the natural beauty and the landscape, mainly through planning controls.

**Biodiversity**

The total range of the variety of life on earth or any given part of it.

**Carboniferous**

Period of the Palaeozoic era, following the Devonian era and preceding the Permian. Economically, the most important system containing the world's coal reserves and oil, oil shale, iron ore and fire clay deposits.

**Countryside Stewardship Scheme**

An initiative of the Countryside Commission, due to transfer to MAFF in 1996, which supports actions to enhance and conserve important English landscapes, wildlife habitats and history.

**Culm grassland**

A habitat which comprises a characteristic mixture of marshy grassland, bog, wet heath and scrubby woodland which supports a wide range of flora and fauna. The habitat is underlain by a geological formation of sandstones and shales.

**Diffuse**

The spreading out of a substance from its source along a concentration gradient; where the two substances intermingle to equilibrate their concentrations via the process of diffusion.

**Ecosystem**

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

**Farm Waste Management Plan**

Plans drawn up by the farmer describing the planned disposal of waste generated on the farm.

**Groundwater**

Underground water that has come mainly from the seepage of surface water and is held in the soil and in pervious rock.

**Heritage Coast**

The finest example of a coastal and adjacent inland area as designated, through co-operation between the Countryside Commission and local authorities, for its protection and enhancement and enjoyment by the public.

**Hydrogeology**

Branch of geology concerned with water within the Earth's crust.

**Riparian Owner**

Owner of land next to river; normally owns river bed and rights to mid-line of channel.

**Runoff**

Rainwater which does not soak into the ground but which is intersected by impermeable surfaces and is passed into gulleys and drains.

**Salmonid**

Game fish of the Salmon family e.g. salmon, trout and sea trout.

**Section 105 Surveys**

Section 105 of the Water Resources Act (1991) allows for Standards of Service, Assets and Flood Risk Surveys.

**SSSI**

Site of Special Scientific Interest or national importance designated under the Wildlife and Countryside Act (1981). Habitats, sites for individual species, geology and land forms may be designated.

**Wildlife Enhancement Scheme**

Set up by English Nature, it is a voluntary scheme which has been designed to develop an effective partnership with managers of land in Sites of Special Scientific Interest.

**UNITS**

**ABBREVIATIONS**

mm	Millimetre
m <sup>3</sup> /s	Cubic metre per second
km	Kilometre
km <sup>2</sup>	Square kilometre
ha	Hectare
<	Less than

ACC	Avon County Council
BofR	Borough of Restormel
CCC	Cornwall County Council
CDC	Carrick District Council
CoCo	Countryside Commission
DAS	Devon Archaeological Society
DCC	Devon County Council
DoE	Department of the Environment
DWT	Devon Wildlife Trust
EC	European Commission
EH	English Heritage
EN	English Nature
HCS	Heritage Coast Service
KDC	Kerrier District Council
MAFF	Ministry of Agriculture Fisheries and Food
NCDC	North Cornwall District Council
NDDC	North Devon District Council
NRA	National Rivers Authority
p.a.	Per Annum
PDC	Penwith District Council
RE	River Ecosystem, RE1, RE2 etc.
RHIER	Royal Holloway Institute for Environmental Research
RQO	River Quality Objective
SCC	Somerset County Council
SDC	Sedgemoor District Council
SSSI	Site of Special Scientific Interest
TDC	Torrige District Council
WDC	Woodspring District Council
WSDC	West Somerset District Council



## REFERENCES

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3. Inventory of Culm Grassland in Devon 1994, Devon Wildlife Trust.
4. NRA South West Region Low Flow Study Final Report Volumes 1 & 2 April 1991; Sir William Halcrow & Partners.
5. Guidance for the Control of Invasive Plants near Watercourses, NRA, 1994, HO-9/94-20K-C-AKVI.

MAP1: THE HARTLAND STREAMS CATCHMENT



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NRA South Western Region

## FOREWORD

*This Action Plan for the Hartland Streams Catchment covers a small but significant part of North Devon. Plans for the River Torridge, Taw/Torridge Estuary and River Taw in North Devon have already been published.*

*The plans embody the National Rivers Authority's commitment to realize improvements to the water environment of North Devon.*

*We are very grateful for the contributions made during the consultation period and are convinced that they represent the spirit of partnership that will be required to implement the plan.*



*Malcolm Chudley  
Area Manager (Devon)*



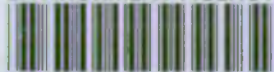
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