EA-South West LEAPs

local environment agency plan

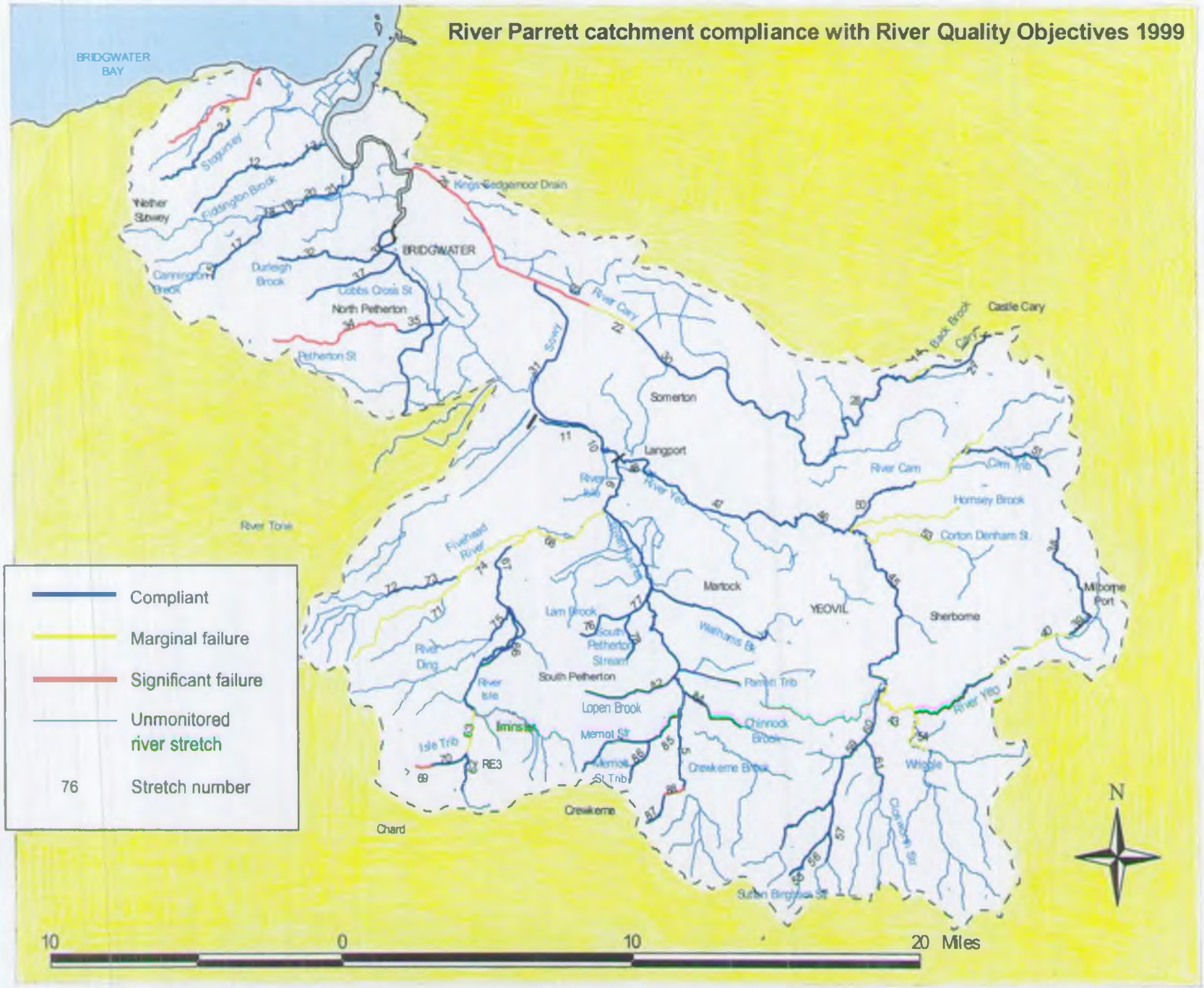
RIVER PARRETT

THIRD ANNUAL REVIEW

OCTOBER 2001

ENVIRONMENT AGENCY

River Parrett catchment compliance with River Quality Objectives 1999



ENVIRONMENT AGENCY
118427

Contents

Figures

Environment Agency Copyright Waiver

This report is intended to be used widely and may be quoted, copied or reproduced in any way, provided that the extracts are not quoted out of context and that due acknowledgement is given to the Environment Agency.

For Further information or copies, please contact:

The LEAPs Team
Environment Agency
Rivers House
East Quay
Bridgwater
Somerset TA6 4YS

Tel: 01278 457333

1. Introduction

1.1. The Environment Agency

The Environment Agency has a wide range of duties and powers relating to different aspects of environmental management (section 6). We are required and guided by Government to use these duties and powers in order to protect the environment and help achieve the objective of sustainable development, defined 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. The creation of the Agency itself in 1996 was in part recognition of the need to take a more integrated and long-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. The local authorities are the focus for community action to work towards a more sustainable way of life at a local level. This is part of the Community Strategy and global Local Agenda 21 initiatives that we are committed to support.

Taking a long-term perspective will require us to anticipate risks and encourage precautions, particularly where impacts on the environment may have long-term effects, or where the effects are irreversible. 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 continued protection and enhancement of the environment.

1.2. Environmental Vision

In September 1997 the Agency published its first national strategy entitled *An Environmental Strategy for the Millennium and Beyond* which set out nine principal and immediate environmental concerns. The Millennium Strategy has recently been under review resulting in a new Environmental Vision, which was launched early in 2001.

The Vision retains nine themes, but they are significantly different, reflecting a change in the Agency's approach. The Vision looks at a much longer timeframe (20 years or more) and recognises to a much greater extent the importance of working with others. Our vision is:

A healthy, rich and diverse environment in England and Wales for present and future generations

The new themes that underpin the Vision are:

- A better quality of life
- An enhanced environment for wildlife
- Cleaner air for everyone
- Improved and protected inland and coastal waters
- Restored, protected land with healthier soils
- A 'greener' business world
- Wiser, sustainable use of natural resources
- Limiting and adapting to climate change
- Reducing flood risk

The Vision sets key targets that we will contribute to, and lists key environmental indicators against which we can measure our performance. Copies of *An Environmental Vision: The Environment Agency's Contribution to Sustainable Development* can be obtained from our Bridgwater Office.

1.3. Local Environment Agency Plans

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. The Agency is committed to a programme of Local Environment Agency Plans (LEAPs) in order to produce our local plan of integrated actions for environmental improvement.

LEAPs are non-statutory, integrated action plans based on local river catchments, and provide a focus for those concerned with the future of the local area. All of the river catchments in England and Wales are now covered by LEAPs.

LEAPs will help contribute to the principle of sustainable development through integrated environmental management and improvement. They will also play a key role in:

- promoting openness and accountability
- developing closer links with the public and with key partners
- educating the public on local environmental issues
- prioritising the Agency's work through an action plan for managing and improving the local area over the next five years
- realising the environmental potential of the area
- forming joint actions and partnerships for environmental improvement

1.4. River Parrett LEAP

The River Parrett Consultation Report was produced in March 1997. This outlined key environmental issues facing the area and options for their solution. Following a three-month period of consultation, during which nearly 500 organisations and individuals were consulted, the Action Plan was published in December 1997. This sets out a five-year programme of actions to improve the local environment and outlines areas of work and investment proposed by the Agency and others. The plan takes into account the views expressed during the consultation process. The Agency reports on progress through the publication of Annual Reviews.

1.5. The Annual Review Process

An important part of the LEAP process is to monitor progress and review the Action Plan on an annual basis, to ensure that targets are achieved and actions completed, and that the plan continues to address relevant issues in an appropriate manner.

This Third Annual Review of the River Parrett LEAP summarises the progress made since publication of the Second Annual Review in May 2000. The progress for each action has been gathered through discussions with the Agency Officers responsible for leading on each particular action, and the Steering Group has been consulted on the draft document. This progress report aims to:

- report on progress made by all those involved
- report on changes to the content or timing of actions, including the addition of new actions and removal of existing actions, and reasons for these
- report on changes and events in the plan area
- report on other matters, such as new legislation or initiatives, affecting the LEAP

We invite readers to contact us at any time to raise new issues or suggest new actions; this ensures the LEAP process is a live one, which constantly evolves to meet the changing needs of the local environment, and local people.

1.6. The River Parrett LEAP Steering Group

This group represents a range of commercial, local authority and environmental interests operating within the catchment. The group comments upon the Consultation Draft, Action Plan and Annual Review prior to publication. They monitor the implementation of the Action Plan and provide us with specific advice on the importance of issues within the catchment.

The group acts as a communication link between the local community and the Agency, and helps to promote environmental initiatives within the catchment. Each of the six catchments in the North Wessex Area has its own Steering Group. The members of the River Parrett LEAP Steering Group are:

Name	Representing
Mr M Bowden	UCB Cellophane Ltd
Mrs Audrey Lennox	The Ramblers Association
Mr J J Mathrick	Wessex Federation of Angling Clubs
Mr Stephen Parker	English Nature
Mr D Westbrook	Somerset Wildlife Trust
Mr S F Chedzoy	Stan Moor District Drainage Board/ Parrett Consortium of Drainage Boards
Mr R Bradford	Somerset County Council / Levels & Moors Partnership
Captain P Lee	Sedgemoor District Council
Mr Richard Dommett	British Waterways
Mr K Hayward	Abacus
Mr D R Cudlipp	Taunton Deane Borough Council
Mr A J Vail	Taunton Deane Borough Council
Miss Jo Milling	Mendip District Council
Mr D H Luxton	Wiveliscombe Parish Council
Mr John Strickland	Royal Ordnance Plc
Mrs Gill Shaw	DEFRA
Mr M Venning	Wessex Water
Mr J Comer	Flood Defence Committee
Mr R England	National Farmers Union
Mr David Holmes	South Somerset District Council
Mr D Rodwell	Sedgemoor District Council
Mr J Greenslade	West Dorset District Council
Ms Julie Cooper	Sedgemoor District Council
Mr Tim Ross	Sedgemoor Action Group for the Environment

1.7. Parrett catchment overview

The River Parrett Catchment covers an area of approximately 1251km^2. The river is about 59km long from its source near Chedington to where it enters the Severn Estuary at Stert, falling 160m to sea level. It flows north from Chedington near Crewkerne, passing Martock, and is joined by the River Isle and River Yeo to the south of Langport. The Parrett becomes tidal at Oath Sluice. The Parrett has an exceptionally long tidal reach, and much of the surrounding land is below high spring tide level. The flood tide carries large quantities of silt from the Severn Estuary, which causes problems for channel management in the tidal reaches.

The River Tone is a major tributary, which joins the tidal Parrett at Burrowbridge. The River Cary rises at Castle Cary and travels in a westerly direction before entering the King's Sedgemoor Drain at Henley Corner, and continuing across the Somerset Moors to join the tidal River Parrett downstream of Bridgwater at Dunball Sluice. There are further contributions below the tidal limit from a number of streams with headwaters on the east of the Quantock Hills.

The Bridgwater and Taunton Canal leaves the Tone at Firepool Lock in Taunton and ends at Bridgwater Docks where a sluice is provided to allow a discharge into the Parrett.

The population size of the catchment is estimated to be 196 000 (1991) and land use is predominantly agricultural. Cereal is grown to the west and east of Yeovil, but traditionally pasture for dairy and beef cattle was predominant until the BSE crisis. There has since been an increase in cereal and vegetable production, with more maize being grown for fodder. The Somerset Levels and Moors Environmentally Sensitive Area scheme is encouraging farmers to farm less intensively, with higher winter and spring water levels than over the past 50 years. Water levels are controlled by a system of rhynes, ditches and sluices, with pumping stations operated by the Agency to return excess water to the rivers.

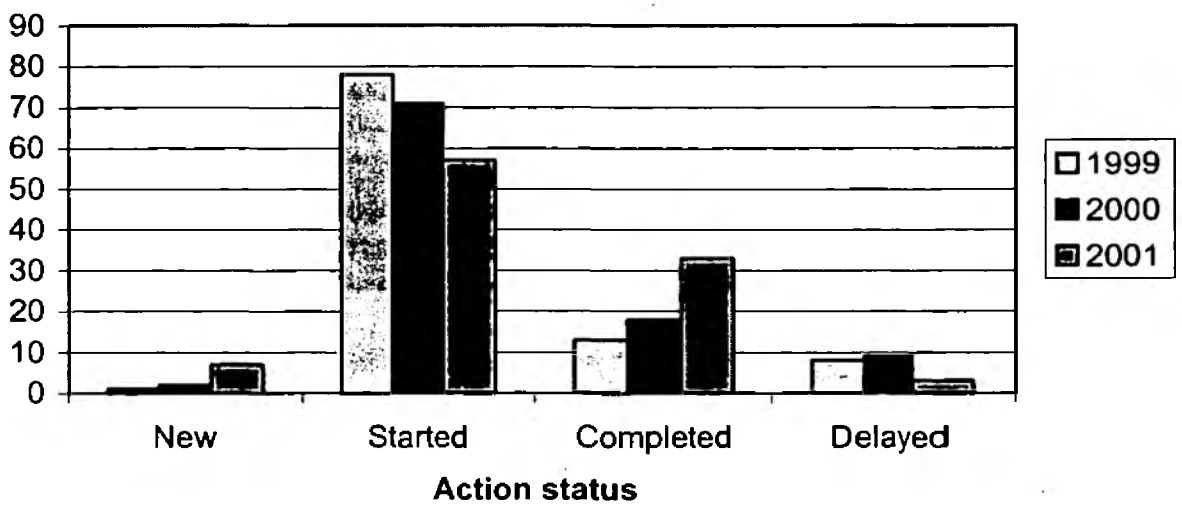
Much of the Parrett Catchment is a valued landscape reflected by both national and county designations. The dominant feature is the low lying moorland landscape, with its pattern of man-made drainage channels, pollarded willows and scattered tree and shrub cover. The area around Bridgwater Bay exhibits similar characteristics, with straight reed-filled ditches draining the open landscape of improved pasture and arable fields. The Quantocks, with their steep-sided valleys, support a more intimate mosaic of oak woodland and scrub, heathland and conifer plantation, with the small fields divided by hedgerows with mature trees. The catchment is very important for wildlife. Of particular interest are the lowland wet grassland resource and freshwater ditch communities of the Somerset Levels and Moors, the largest remaining area of these habitats in Britain. Seven of the wetland Sites of Special Scientific Interest have been designated as a Special Protection Area and Ramsar site of international conservation importance for over-wintering wildfowl and outstanding assemblages of aquatic invertebrate communities (see section 3.1 for details of designations).

2. Progress

2.1. Summary of progress

When the second Annual Review was published in 2000, 23 actions out of a total of 114 had been completed (14 in 1999 and 9 in 2000), and 6 new actions had been added to the original action plan. Of the 104 actions in this year's plan, progress has been made on all but 3 actions. 35 actions have been completed and 7 new actions introduced. This progress is summarised in Figure 1.

Figure 1: Summary of progress to date (%)



1999 shows the progress reported in the First Annual Review and 2000 shows progress made when the Second River Parrett Annual Review was published. The progress reported on in this document is shown as 2001.

2.2. Key achievements

River Quality

The General Quality Assessment is the tool we use to examine long term trends in river quality. There can never be total confidence in assigning the true General Quality Assessment (GQA) grade (see section 5.2) to a stretch of river because of statistical and analytical errors. River stretches are upgraded or downgraded based on the calculation of the statistical confidence (%) that a grade change has occurred. This information can be used to identify substantial changes in grade and investigate possible reasons for this change.

The stretches in the Parrett catchment with a substantial upgrade (75% confidence or above) are shown below in Figure 2 and are indicative of improvements in water quality. No stretches in the catchment were downgraded.

We set targets for river quality called River Quality Objectives (RQO) based on the type of river stretch and the use made of the water. We take these into account when setting permitted levels of discharge in Agency consents. The compliance of individual stretches with River Quality Objectives (RQO) is given in section 5.1.

Figure 2: Stretches with significant GQA upgrades 1998-1999

River	Stretch Name	1998 Grade	1999 Grade	Reason for improvement
Durleigh Brook	Upstream Durleigh Reservoir – downstream Durleigh Reservoir	D	C	Reason unknown. A survey was completed in 1999.
Durleigh Brook	Downstream Durleigh Reservoir – confluence with tidal Parrett	D	C	Reason unknown. A survey was completed in 1999.
Yeo	Charlton Horethorne Sewage Treatment Works – Milborne Wick	D	C	Receives input from Charlton Horethorn Sewage Treatment Works and was poorly performing until about 3 years ago when works were improved.
Lam Brook	West Lambrook – confluence with South Petherton Stream	B	A	A trader discharged to the headwaters of the stream, and the discharge had high Biochemical Oxygen Demand results. About 3 years ago the discharge was connected to the foul sewer.
Lam Brook	West Lambrook – confluence with South Petherton Stream	B	A	As above.
Cary	Charlton Mackrell – Somerton Randle	C	B	Pollution prevention campaign undertaken in 1998; a number of farms were identified as having waste management problems, subsequently resolved. Over the last two years much effort has also been put into ensuring Dimmer waste disposal site discharge complies with its consent and improves its site controls. This used to discharge into Back stream (tributary of Cary), and now discharges direct to the Cary.
Cary	Higher Farm – Charlton Mackrell	C	B	As above.
Cary	Source – Cockhill	C	B	As above.
Cary	Cockhill – Lovington	C	B	As above.
Cary	Babcary – Higher Farm	D	C	As above.
Cary	Lovington – Babcary	D	C	As above.
Cannington Brook	Blackmore Farm – Bradley Green	D	B	Improved farm waste management systems at Blackmore Farm since 1997, and also continued improvement at Cannington Creamery.

The River Parrett Mid-Water Streams Project

Over the last two years the Agency has supported collaborative projects in the Tone and Brue catchments with the Farming and Wildlife Advisory Group and Somerset Wildlife Trust. The projects have aimed to help farmers and landowners enhance environmental interest and reduce agricultural impact caused by runoff and soil erosion.

Many improvements have been achieved through the Countryside Stewardship Scheme administered formerly by the Ministry of Agriculture, Fisheries and Food (MAFF), and now by the Department for Environment, Food and Rural Affairs (DEFRA). This grant Scheme encourages applications to enhance the wildlife, landscape, historic and amenity value of their holding through a ten year programme of works. In the Tone, the project has already delivered over 33 km of 6 metre-wide buffer strips along watercourses, together with many other environmental improvements; buffer strips help prevent soil and chemicals which affect water quality from entering rivers. Additional Countryside Stewardship applications encouraged through the project will increase this figure to over 100 km of 6 metre-wide buffer strips.

Since September 2000 the Agency has been supporting a similar project in the Parrett catchment, covering the streams and waterways that flow into the internationally important Somerset Levels and Moors.

The project partners are working with farmers and landowners to:

- use existing grant schemes including Countryside Stewardship to obtain environmental benefits
- reduce the risk of agrochemical and farm waste pollution causing environmental damage
- raise the profile of soil erosion that can be tackled by good agricultural practice and management

The projects have also been working with farmers to optimise soil management practices to tackle runoff problems at source. These measures (along with the ESA in the Lower Catchment) will help enhance the wildlife habitat and other environmental interests on these watercourses and adjoining land, to the benefit of species such as otter, water vole, water shrew, kingfisher and brown trout, together with farmland birds, invertebrates and aquatic plants. This initiative will bring wide benefits to the catchment and will help to address issues 1, 3, 5, 12 and 15.

2.3. Resources

Nationally the Agency spends over £600 million each year on protecting and improving the environment. Approximately 75% of this is derived from our own charges, principally in the form of licence fees and the flood defence levy on local authorities, which covers part of the cost of our Flood Defence function. The remainder is funded by Government grants; our main sponsor in Government is the Department for Environment, Food and Rural Affairs (DEFRA). The Agency also has links to the National Assembly for Wales.

All our charges are reviewed annually and are assessed through consultation. Charge proposals are subject to approval by the Secretary of State, and Regional Flood Defence Committees approve flood defence levies.

The following figures (Figure 3) from the North Wessex Area Business Plan 2000-2001 have been included to give an indication of available resources and expenditure on Agency functions, to provide a context for spending priorities. Regrettably we are not able to give the same breakdown of expenditure for the Parrett catchment.

A large proportion of this budget is used to undertake work required of us by legislation and regulation, and by the Agency's own requirements which apply nationally. This includes committing substantial resources to everyday monitoring and management of the environment. Remaining resources are used to undertake other environmental works throughout the area on a priority basis, reviewed annually as part of our business planning process.

Figure 3: North Wessex Area expenditure 2000-2001

Function	Area Expenditure
Environment Planning	£ 1,147,000
Environment Protection	£ 1,810,000
Flood Defence & Water Resources	£ 5,165,000
Fisheries, Ecology & Recreation	£ 754,000

2.5. Priorities

The issues identified in this plan have arisen despite our considerable statutory work and the work of other organisations. Some issues can be resolved by reprioritising and redirecting our resources within our statutory work programme, sometimes requiring the help and co-operation of other bodies. Other issues require action over and above our statutory work and funding. Resources for this work are not certain and matched project funding is usually required in these cases.

Some issues require solutions beyond the scope of our existing budgets or technology. However, these are still valid issues and so are included in this plan in the hope that a solution may be found in the future.

Although the Action Plan period is for five years, because of the short-term nature of our funding, we can often only firmly commit ourselves to actions in the current and next financial years. Our priorities, policies and budget may change, so changing our action programme. The actions in this plan have been prioritised, together with those from our other LEAP areas and other proposed actions as follows:

Priority 1: **High**

4.6, 5.3, 11.2, 12.1, 12.4, 12.5, 12.6, 12.9, 14.1, 15.1, 15.9

Priority 2: **Medium**

1.1, 1.3, 1.11, 1.14, 2.5, 2.8, 3.3, 3.5, 3.13, 5.1, 5.4, 5.5, 6.2, 6.5, 6.6, 6.7, 6.8, 11.1, 11.3, 11.5, 12.10, 12.16, 12.18, 12.19, 13.1, 13.5, 15.2, 15.4, 15.5, 15.6, 15.8, 18.1

Priority 3: **Low**

11.4, 12.11, 12.20

Priority 0: **Core work**

1.16, 4.2, 4.4, 5.2, 5.8, 7.1, 7.2, 7.3, 9.1, 9.2, 10.1, 12.7, 12.8, 12.12, 12.14, 13.3, 13.4, 12.17, 15.7, 16.1, 17.1, 17.4

3. New legislation and initiatives

3.1. Habitats Directive

The European Community Birds Directive and the Habitats and Species Directive place responsibilities on the Agency in addition to our normal conservation duties. The aim of the legislation is to protect and conserve certain threatened species and habitats throughout Europe. This is to be achieved by the establishment of a network of nature conservation sites that will be known as the Natura 2000 Network. Natura 2000 sites are Special Protection Areas (SPAs) which are designated under the Birds Directive, and Special Areas of Conservation (SACs) which are designated under the Habitats Directive. It is Government policy that RAMSAR wetland sites (sites identified under the Convention on Wetlands of International Importance, which was ratified by the United Kingdom Government in 1976) will also be considered under the Habitats Regulations.

The Government has decided that once a possible Special Area of Conservation (pSAC) has been submitted to Brussels (i.e. it has become a candidate Special Area of Conservation or cSAC) the Regulations will apply. There are four sites in the Parrett catchment that will become part of the Natura 2000 network.

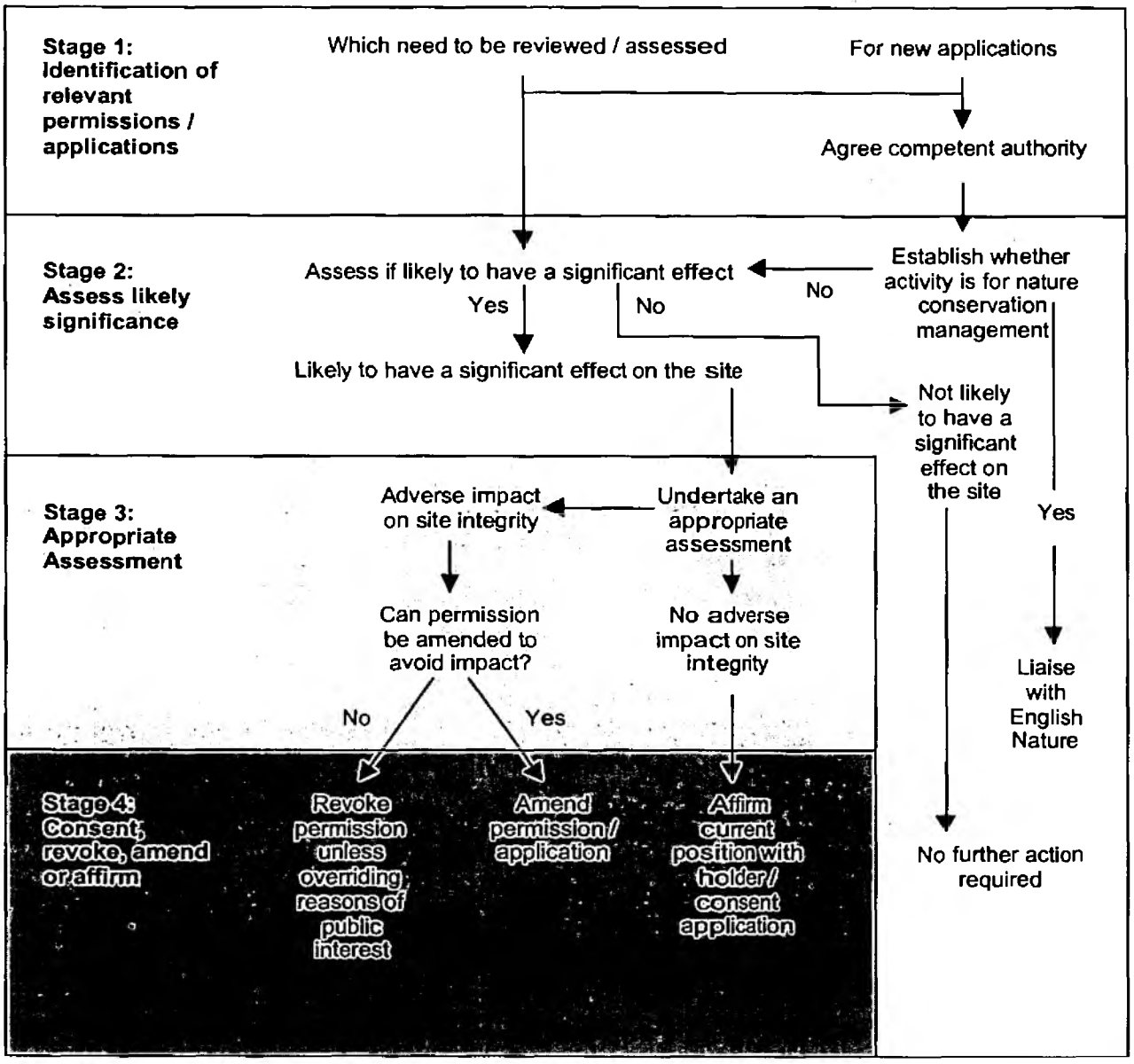
Figure 4: Natura 2000 sites in the River Parrett catchment

Site	Designation	Qualifying interests
Severn Estuary	SPA	Supporting wintering Bewick's Swan; over 20 000 wintering wildfowl and 5 species of migratory waterfowl (European white-fronted goose, shelduck, gadwall, dunlin, redshank)
	RAMSAR	Important run of migratory fish between the sea and the sub-estuaries (including salmon, sea trout, sea lamprey, river lamprey, allis shad, twaite shad and eel); immense tidal range, supporting over 85 000 waterfowl; staging area for over 1500 whimbrel
	pSAC	Estuaries, intertidal mudflats and sandflats; atlantic salt meadows; submerged marine habitats; subtidal reefs; fish (allis shad, twaite shad, sea lamprey, river lamprey)
Somerset Levels and Moors	SPA, RAMSAR	Bewick's swan; golden plover; teal; wintering waterfowl numbers in excess of 20 000; outstanding assemblage of ditch flora & fauna, particularly water beetles
Exmoor and Quantock Oakwoods	cSAC	Alluvial forests with alder Alnus glutinosa and ash *Fraxinus excelsior*; Barbastelle bat *Barbastella barbastellus*; Otter *Lutra lutra*; Bechstein's Bat *Myotis bechsteinii*; Old sessile oak woods with holly *Ilex* and hard fern *Blechnum*
Bracket's Coppice	cSAC	Fens and wet habitats (not sensitive to acidification) - *Molinia* meadows on chalk and clay; mammals of wooded habitats - Bechstein's bat *Myotis bechsteinii*

The Agency, as a 'Competent Authority', has extra responsibilities to safeguard these sites. Any applications for new authorisations (consents to discharge, abstraction licences, waste licences) and activities (land drainage or flood defence work), that may have a significant effect on a Natura 2000 site, will be subject to an appropriate assessment of the likely impact on the conservation interests of the site. We are obliged to review all existing authorisations and activities that may be affecting the sites. These authorisations can be either inside or outside the site, as those outside the boundary may still have the potential to impact on the site's qualifying interests.

Figure 5 summarises the identification and authorisation process under the Regulations. Any activity that could impact on the Severn Estuary will also need to be considered under the Regulations. The appropriate assessment of the effect of a new or existing activity or authorisation on a Natura 2000 site must take place in the light of conservation objectives that are being supplied by English Nature. The authorisation or activity can only be allowed where the assessment has demonstrated that it will not adversely affect the integrity of the site.

Figure 5: Summary of the consents process under the European Community Habitats and Birds Directives



3.2. Flood management

The flooding that affected the Somerset Levels and Moors in the winter of 2000 was some of the worst since records began. This concentrated attention on the need for strategic options for flood defence in the Parrett catchment.

Review of Flood Management Practices

Prior to recent flooding events, work had already begun on consultation of a Review published in July 1999. Responses to this document were collated with the guidance of a Steering Group set up by the Somerset Local Flood Defence Committee, and consultants were commissioned to study various options and their impact on flood risk in the Levels and Moors.

Early 2000 saw the launch of two new initiatives with which the Review became closely aligned. The European Union funded Wise Use of Floodplains (WUF) Project studied the social and economic impact of flooding on the area communities, and via the Levels and Moors Partnership (LAMP) undertook a series of stakeholder workshops.

The feedback from these workshops was used to identify issues to be considered by the Parrett Catchment Project. Launched by Somerset County Council in February 2001, this project has produced a 50-year draft strategy of 11 measures dealing with the catchment on a holistic basis.

The Review has used the invaluable local input from these two initiatives to guide its work. A consultation document was published in April 2001, and it presents options which are combinations of 18 components, including the 11 measures of the Parrett Catchment Project, all of which the Review study has been able to evaluate further, adding to the technical output.

In the consultation document, the Steering Group has suggested those options that appear most effective. Dependent on consultation responses, the preferred options will form an Action Plan for Flood Management Practices, which will be a companion document to the September 1999 Somerset Levels and Moors Water Level Management Action Plan, the first review of which was produced in November 2000.

The Levels and Moors Partnership and the Wise Use of Floodplains Project have organised workshops to aid the consultation process. They are also looking to carry forward some of the Parrett Catchment Project initiatives that the Environment Agency cannot make priorities in its Flood Management Practices Action Plan.

Catchment Flood Management Plans

A Catchment Flood Management Plan studies all flood risks within a catchment, and the processes that affect them. The impacts on the risks of a number of different scenarios, such as storage or flood warning, are investigated. The River Parrett catchment was chosen as one of only five national pilot studies to inform DEFRA's guidelines, due to be published in September 2001. The Parrett Catchment Flood Management Plan will be completed for consultation in September and will provide guidance on options to be considered for flood risks outside the Levels and Moors.

Flood warning

Absolute flood protection is not possible and so effective warnings are essential, especially where a flood defence scheme cannot be justified. We issue warnings through the media, the Agency's Floodline telephone service, and directly to people in some areas by telephone, fax or pager, or by local flood wardens or sirens.

During 1998 much of England and Wales were seriously hit by floods, both at Easter and again in October. An independent report was commissioned to look at how we dealt with these floods; the result was the Bye Report, published on 1 October 1998. In response we published our own Easter Floods Action Plan. Findings from both these reports and consultation with the Government set new priorities to ensure the delivery of an improved Flood Warning Service:

A seamless and integrated service of flood forecasting, warning and response

One of the key developments resulting from the review of flood warning is the implementation of a new flood warning code system. The colour-based flood warning code system (yellow, amber, and red) has been replaced with a staged approach since September 2000. Under the new system there are four stages of warning:

- **All-clear:** No flood watches or warnings currently in force in the area; flood water levels receding; check all is safe to return; seek advice.
- **Flood watch:** Flooding is possible; be aware; be prepared; watch out.
- **Flood warning:** Flooding of homes, businesses and main roads is expected; act now.
- **Severe flood warning:** Severe flooding is expected; imminent danger to life and property; act now.

There are up to 100,000 properties at risk of flooding in the South West alone. Climate change threatens to increase the risk of flooding, and development in flood-prone areas may compound the problem. In September 2001 we also mailed 843,000 homes and businesses in flood risk areas throughout England and Wales as part of Flood Action Week. The package sent out

included a flood plan checklist of actions people can take to protect themselves and their property, and an emergency card containing information about the new flood warning codes.

Floodline 0845 988 1188 was introduced in 1999, and is an integral part of the new system. The service gives details 24 hours a day of flood warnings in force, and advisors can give callers advice to protect homes and property. Floodline received over 90,000 calls before October 2000, and over 500,000 calls during October and November alone following last autumn's flood events. We aim whenever possible to give at least a two-hour warning, based on weather information and our own telemetry readings. The flood warning service is based on the principle that the better-prepared people are, the better they will cope with the effects of flooding.

From September this year, responsibility for flood warning will pass from Region to the Agency's Area offices, while Region will concentrate on developing flood forecasting.

Floodplain maps

Since December 2000 floodplain maps have been added to the Agency's website. The indicative floodplain maps provide an overview of flood risk in England and Wales. Users can enter the name of a town or a postcode and see which areas of England and Wales are at potential risk of flooding. The maps do not distinguish degrees of risk, which will be higher in undefended, low-lying areas near rivers or the sea.

It is important to note that the fact that a property lies within a floodplain does not mean that it will definitely experience flooding, nor does it denote any particular degree of risk; there are a significant number of factors that cannot be mapped at this level of detail. Further information is available from Floodline or direct from Agency Offices.

The maps were launched because independent research for the Agency indicated that, despite growing awareness, over 50% of people who live in flood risk areas were still not aware that their property may be at risk from flooding. The Agency has already provided copies of the indicative floodplain maps to all local authorities in England and Wales to help with emergency planning and development control decisions. The floodplain maps can be accessed by clicking on 'What's in your backyard?' on the Agency's website: **www.environment-agency.gov.uk**.

3.3. Changes in abstraction licensing

Nearly everyone who needs to abstract water from rivers, canals, reservoirs, lakes or from groundwater sources requires a licence from the Environment Agency. There are about 48 000 licensed abstractions in England and Wales.

Since the present licensing system was introduced in 1965, demand for water has increased, environmental expectations have grown and commercial practices have changed. As a result, the Government reviewed the licensing system during 1997-1998, publishing its report *Taking Water Responsibly* in March 1999. This review has resulted in some important changes. Initially we are concentrating on the following areas, which do not require new primary legislation:

- Catchment Abstraction Management Strategies
- time-limiting of licences
- restoring sustainable abstraction by dealing with damaging abstractions
- review of licence administration procedures

Catchment Abstraction Management Strategies (CAMS)

This major initiative will provide the opportunity, at a local catchment level, for groups and individuals to contribute to the development of the strategy to be adopted for the catchment. Catchment Abstraction Management Strategies will provide information on:

- the availability of water in a catchment
- licensing practice in dealing with new applications
- changes needed to the abstraction regime in the catchment to achieve the sustainable long-term use of water resources
- a transparent basis for planning by abstractors, the Agency and all other interested parties

A national consultation exercise on our proposals for the production of Catchment Abstraction Management Strategies closed on 31 July 2000. Following the consultation a National Support Document was published in April 2001. Catchment Abstraction Management Strategies will be published one at a time on a six-year rolling cycle. In North Wessex we hope to publish our first Strategy in 2003 which will cover the River Tone catchment. The Parrett strategy is due to start in 2003 for publication in 2005.

3.4. Waste management

The National Waste Production Survey took place between October 1998 and 1999 and involved 20 000 companies nation-wide. It was the largest of its kind ever undertaken in the United Kingdom. Data was collected from companies across a variety of industrial and commercial sectors on the amounts and types of wastes produced and how it was managed. The data collected by the Survey has been used in the production of the 'Waste Strategy 2000', a statutory strategy published by the Government in May 2000.

Waste Strategy

The Waste Strategy 2000 continues many of the principles of its predecessor 'Making Waste Work' (see the First Annual Review). The overarching principle is that decisions regarding waste management should be consistent with the Best Practicable Environmental Option (BPEO). This considers the protection and preservation of the environment in the long and short terms and is likely to be different for each waste stream in each location.

The Waste Strategy contains many statutory targets for local authorities as well as aspirational targets for industry and commerce, and identifies the roles of interested parties such as local authorities, the waste management industry and the Environment Agency. Discussion on the available waste management techniques and different waste streams is also included.

Strategic Waste Management Assessments

As a requirement of Waste Management Licence conditions we receive data from site operators relating to the amount of waste each site has managed in a set period, usually quarterly. This data is amalgamated to provide statistics on how much waste is being managed at licensed sites within a particular area, district or country. This data, combined with data from the National Waste Production Survey, can then be used for planning purposes.

In particular it can be used in the production of the Agency's own Strategic Waste Management Assessments (SWMAs). These advise regional planning functions such as Regional Technical Advisory Bodies, and advise local authorities about the provision of land and resources for waste management, particularly regarding Waste Local Plans, but also other plans which include waste as a factor. The Agency's South West Region Strategic Waste Management Assessment was published at the end of 2000.

Waste Local Plans are prepared by the local authority. Somerset County Council is responsible for the development and drawing up of Waste Local Plans for the Parrett Catchment. Further information is available from the County Council.

The Producer Responsibility Obligations (Packaging Waste) Regulations

These Regulations place an obligation to recycle and recover certain amounts of packaging on those companies that supply more than 50 tonnes of packaging per annum and also have an annual turnover greater than £2 million. Proof of recycling and recovery is required by the Agency and can be provided by an Accredited Reprocessor (a company that voluntarily registered with the Agency and has had the process of packaging recycling and recovery checked by the Agency). Producer Responsibility will be extended in the next few years to include end of life vehicles, waste electrical and electronic equipment and batteries. The Waste Strategy 2000 includes the possibility of including junk mail.

Landfill Tax

The landfill tax, introduced on 1st October 1996, is payable on every tonne of waste taken to landfill. It is designed to make other waste management techniques more practicable economically with the aim of reducing the amount of waste going to landfill. The tax currently stands at £11/tonne for non-inert waste, going up by £1/tonne in 2003 and £2/tonne for inert waste, and is enforced and collected by Her Majesty's Customs and Excise. Site operators can enrol on environmental bodies, enabling up to 20% of the tax to be reclaimed for use on specific environmental projects.

Landfill Directive

Changes are likely to be required to operating landfills over the next few years in order to comply with the EU Landfill Directive, transposed into UK legislation on 16 July 2001. All new sites must comply with the Directive from this date, whereas existing landfills will have a transitional period within which to comply. The key changes include:

- reduction in the amount of biodegradable waste going to landfill
- classification of sites as hazardous, non-hazardous and inert
- treating waste prior to landfill
- ban on the disposal of certain wastes to landfill, e.g. explosive or corrosive wastes
- whole tyres will be banned from landfill by 2003 and shredded tyres from 2006

The Environment Agency will be responsible for implementing and enforcing the new regulatory requirements for landfills in England and Wales.

3.5. Contaminated Land Regulations

Part IIA of the Environmental Protection Act 1990 came into force in England on 1 April 2000, and introduces a new regulatory regime for the identification and remediation of contaminated land. The new regime requires local authorities to identify contaminated land within their areas and provides a statutory definition of contaminated land:

'any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that significant harm is being caused or there is a significant possibility of such harm being caused; or pollution of controlled waters is being, or is likely to be, caused'

Certain contaminated land sites may become designated as 'Special Sites' and these will become the responsibility of the Agency. Contaminated land is designated as a special site if the site falls within one of the descriptions defined in the Contaminated Land (England) Regulations 2000. These descriptions are summarised within Figure 6.

Once sites have been designated as Special Sites we will liaise with the landowners and other appropriate persons to ensure a timely programme of remediation where action is required. No Special Sites have yet been identified in this catchment. Details of Special Sites will be kept on a Public Register, maintained by the Agency. The Agency also has a role to provide relevant information and advice to local authorities, particularly regarding pollution of controlled waters.

Figure 6: Conditions for designation of contaminated land as Special Sites

Any of the following activities have been carried out at any time:

- disposal of waste acid tars in a retention basin
- purification of crude petroleum or oil
- manufacture or processing of explosives
- the manufacture, production or disposal of chemical weapons
- the manufacture, production or disposal of biological agents or weapons
- an authorised prescribed process

The land is used for any of the following:

- naval, military or air force purposes
- an atomic weapons establishment
- within a nuclear licensed site
- activities which are subject to Section 30 of the Armed Forces Act 1996

Land which is affecting any controlled waters that:

- are used as a drinking water supply, and are likely to require treatment in order to be fit for human consumption, or
- are not likely to meet the requirements for water quality specified in regulations made under the Water Resources Act 1991, or
- are contained within one or more defined aquifers and where pollution relates to one or more of the defined substances

D) The land appears to be contaminated as a result of the escape of substances from sites that meet any of the descriptions for A and B.

3.6 Integrated Pollution Prevention and Control (IPPC)

One of the Agency's key responsibilities is to prevent pollutants from major industrial processes being released into the environment. Where releases do occur, we try to make sure they are minimised and made harmless. Regulations identify industrial processes that use or produce potentially harmful substances in significant amounts, known as prescribed processes and substances. Broadly, these are the industrial processes with the greatest potential to cause pollution. Local authorities regulate smaller, less complex industrial processes.

The United Kingdom was one of the first countries in Europe to introduce an integrated regulatory system, and many individual processes have been authorised under Integrated Pollution Control (IPC).

A similar approach will be introduced throughout the European Union under the new *Integrated Pollution Prevention and Control Directive* (IPPC). Integrated Pollution Prevention and Control came into force in the UK on 1 August this year. This will apply to a broad range of industrial and commercial sectors, most subject to existing but separate authorisation schemes for their emissions to water, air and land. Sectors such as those involved in food and drink production and intensive agriculture will be regulated by permits for the first time.

We previously regulated discharges to water by sectors not covered by Integrated Pollution Control by issuing consents, which restrict the amount and type of pollutants that can enter a watercourse.

While existing sites will be phased into the new regime between now and 2007, any new sites under development will be subject to Integrated Pollution Prevention and Control with immediate effect.

The Integrated Pollution Prevention and Control Directive requires member states to prevent or, where that is not possible, to reduce pollution from a range of industrial and other installations, by means of an integrated permitting process based on the application of 'best available techniques'.

The integrated approach takes a wide range of environmental impacts into account such as emissions of pollutants (to air, water and land), energy efficiency, consumption of new materials, noise and site restoration. The aim is to achieve a high level of protection for the environment as a whole. Pollution Prevention Control (PPC) Permits must take into account local environmental conditions at the site concerned, its technical characteristics and its geographical location. Conditions must be included to address any transboundary pollution from an installation and also to ensure, where necessary, that any environmental quality standard laid down in European Community legislation is not breached.

3.7. Fisheries

In 1999 a review of policy and legislation applying or relevant to salmon and freshwater fisheries was carried out by an independent review group on behalf of Ministers. The group was asked to make recommendations. Naturally the Environment Agency, which itself gave evidence has awaited with great interest the output. The group made a total 195 recommendations and the Ministry of Agriculture, Fisheries and Food published the 'Salmon and Freshwater Fisheries Review' in 2000. This review then went out to public consultation. Many of the recommendations for change would need changes in legislation. The Government have now debated the review and published their response in January 2001. This review and any future changes as a result of it will be very relevant to the work of the Agency's Fisheries function.

We continue to protect the local fisheries in the Parrett catchment through enforcement of fisheries laws and the screening of consents and permissions within the planning and development control process. A public consultation occurred in 2000 on the Agency's 'Draft National Eel Management Strategy' and on the 'Draft Eel Net Licensing System, Duties and Byelaws'. The National Eel Strategy was published this year.

The rivers and streams within this catchment are surveyed for their fish populations currently within a five-year rolling programme. A new national monitoring programme has now been formulated for the future whereby some rivers will be surveyed annually and others every five years, depending on the purpose of the survey. The rivers to be surveyed within this catchment are the River Cary, River Isle, River Yeo, King's Sedgemoor Drain, West Sedgemoor Main Drain and the River Parrett.

3.8. The Agency's own environmental management

Nationally we have developed an Environmental Management System to monitor our own environmental performance. An Environmental Management System is a systematic way of managing the environmental impact of an organisation. A successful system will deliver a continual improvement in our environmental performance, and create potential for substantial cost savings.

The Agency will support continuous environmental improvement by the establishment of demanding but achievable and measurable environmental performance targets, determined and reviewed annually. These targets cover aspects of energy and resource use, waste minimisation and recycling. Our targets for 2001-2002 are set out in Figure 7, and progress will be covered by a new action (18.2). The targets set are national targets to be achieved within a timescale of five

years. Achievement of the targets will fulfil the Agency's commitments under the Greening Government Initiative and will also result in real business benefits.

Figure 7: National Environmental performance targets 2001-2002

Aim: A greener business world

Target 1: Develop and externally certify the Environment Agency Management System to ISO9001/14001 by April 2002.

Aim: Limiting and adapting to climate change

Target 2: To reduce buildings energy consumption by 10% from a 1999/00 baseline by the end of March 2005:

- We will progress this through the achievement of site specific targets at 65% of sites by the end of March 2002.

Target 3: To purchase 6 million kWh of renewable generated electricity by the end of March 2005:

- We will progress towards this by purchasing an additional 1.2 million kWh from a baseline of 2000/01 by the end of March 2002.

Aim: Improve and protect inland and coastal waters

Target 4: To reduce buildings water consumption by 10% from a 1999/00 baseline by the end of March 2005:

- We will progress towards this through the achievement of site specific targets at 65% of sites by the end of March 2002.

Aim: Wiser, sustainable use of natural resources

Target 5: To reduce office waste by the end of March 2005 in the following areas:

- residual waste from offices by 20% (5% per annum) from a 1999/00 baseline
- reduce the purchase of paper by 10% (2.5% per annum) from a 1999/00 baseline

Aim: Cleaner air for everyone

Target 6: To reduce total vehicle emissions by 10% from a 1999/00 baseline by the end of March 2002, to include:

- 9% mileage reduction from a 1996/7 baseline focusing on office based staff and miles driven in private cars
- the purchase of an additional 40 alternatively fuelled badged vehicles

3.9. Road transport

Although the Agency has no formal remit in relation to road transport, many of the associated issues have a bearing on the Agency's ability to regulate and manage the environment effectively. The need to take a holistic, long-term view of this issue is at the heart of the principal aim of sustainable development.

Road transport has long been acknowledged as a major source of air pollution, nitrogen oxides and particulate matter being the main pollutants. Nitrogen oxides and volatile organic compounds from vehicles are also precursors of ozone which has a detrimental effect on health. Lead also has a wide range of toxic effects. Petrol engines accounted for almost 75% of carbon monoxide emissions in 1997. Petrol also contains the carcinogens benzene and 1,3 butadiene, which are released to the atmosphere during combustion. Also fine particulate matter PM10 s emitted by diesel engines are a contributor to respiratory diseases such as asthma and bronchitis.

The Agency as a statutory consultee to local planning authorities advises on issues within our remit when new roads are proposed. In addition to air pollution, impacts can include:

- habitat loss and barriers to species movement
- diffuse water pollution from accidental spillages
- climate change
- increased flood risk

- cumulative effects on the environment through related land uses such as petrol stations and increased use of raw materials (including aggregates and petroleum)
- loss of landscape value and increased noise nuisance

Since 1997 the Agency has been involved in a number of initiatives concerned with transport at a national level, particularly through the National Centre for Risk Analysis and Options Appraisal. The Centre has been closely involved in developing a new approach to appraisal for road schemes, which was used to appraise the short-term programme for roads in 1997. This resulted in the Roads Review in 1998, a process which substantially reduced the number of road-building projects. Our North Wessex Area Office is also working locally on air quality through its membership of the steering group of the University of the West of England's Air Quality Management Centre, and has contributed to the cost of running the Centre.

3.10. Water Framework Directive

The EC Water Framework Directive is intended to be transposed into UK law by 2003. It introduces a new approach to improving the status of all waters and will eventually repeal much of the existing EC water legislation. The main requirement is that all surface and groundwaters achieve 'good' status by 2015.The former Department of the Environment, Transport and the Regions (DETR) has proposed that the Environment Agency be the competent authority for the Directive. The main activities under the Directive will be carried out in river basin districts. Within these there will be a series of consultations before the first programme of measures are introduced in 2012 to ensure compliance with environmental objectives for each river basin by 2015.

3.11. Water Resources Strategy

The Environment Agency is the statutory body with a duty to secure the proper use of water resources in England and Wales. In accordance with this duty, we published a water resources strategy for the Agency's South West Region in March 2001. It is one of a suite of eight regional strategies, plus the overall national strategy for England and Wales, which look some 25 years ahead. The strategy considers the needs for water, both for the environment and for society, and examines the uncertainties about future water demand and its availability.

The strategy is part of a framework of integrated water resources planning carried out by the Agency and water users. Water companies play an important part in this framework, each having a published plan for the next 25 years that is kept under annual review. Our strategy sets a structure within which these plans can be refined, allowing them to meet the wider objectives of society.

The strategy identifies demand management and water resource development options that are able to help ensure adequate supplies of water across all sectors and shows that we can manage water resources over the next 25 years in a way that will allow an improvement to present levels of environmental protection.

3.12. Countryside and Rights of Way Act 2000

This new Act covers several areas that are potentially important for the Environment Agency. The access to the countryside section is concerned with areas of land to which the public will in future have access, subject to certain conditions. The Act also introduces measures to review rights of way. There are provisions to promote access for people with mobility problems, and sections dealing with the impact of rights of way in respect of nature conservation, e.g. new powers to divert rights of way to protect Sites of Special Scientific Interest. The section covering nature conservation and wildlife enforcement is likely to be the one with the most impact for the Agency. The Act also includes provisions to allow the better management and protection of Areas of Outstanding Natural Beauty.

4. Actions update

4.1. Completed actions

The following actions have been reported as complete in the previous two Annual Reviews and so have now been removed from the current list of actions. However actions may be reinstated if an issue, which is currently considered resolved, appears to have again become a problem in the future. Please see the Second Annual Review for details of the completion of these actions.

Action	Status
1.8. Historic marginal non-compliance with RE3 on Chinnock Brook - East Chinnock to confluence with Parrett. Ensure the farms identified install the necessary improvements.	Complete. Full compliance since 1998, but will continue to review routine monitoring data.
1.9. Historic marginal non-compliance with RE3 on Chinnock Brook - East Chinnock to confluence with Parrett. Continue to assess the effectiveness of the farm improvements.	Complete. Full compliance since 1998, but will continue to review routine monitoring data.
1.10. Pesticide residues in Durleigh Reservoir catchment. Liaise with Wessex Water over results of their pesticide monitoring to determine how effective recent pollution measures have been.	Complete. We continue to raise awareness amongst farmers of the need to apply and store pesticides with care. There will be ongoing involvement by the Agency with the FWAG collaborative project.
1.12. Marginal non-compliance with long term RQO of RE3 on Corton Denham Stream - Rimpton to Confluence with Yeo. Point source agricultural pollution identified at Staffords Green.	Farm improvement scheme completed in 1998, report produced and problem resolved.
1.13. Marginal non-compliance with long term RQO of RE2 on Sutton Bingham Steam - Higher Halstock to Downstream Sutton Bingham Reservoir. Point source agricultural input identified. Improvement scheme in progress.	Complete. Downstream samples do not indicate any problems following changes in farm operation.
1.15. Non-compliance with European Commission Surface Water Abstraction Directive nitrate standard at Ashford Reservoir. Investigate source of farm runoff and take appropriate action.	Complete. Reservoir is now compliant.
3.1. Biological class d site on the South Petherton Stream at East Lambrook. We will investigate the cause.	Action closed as non-compliance is due to naturally poor substrate.
3.9. Marginal non-compliance with River Quality Objective of RE2 on Durleigh Brook - Pightley to u/s Durleigh Reservoir. Investigate the cause of the non-compliance.	Action closed as non-compliance is due to naturally low dissolved oxygen levels.
3.10. Non-compliance with EC Dangerous Substances Directive List II, copper EQS at receiving water downstream of Walpole Drove Waste Disposal site. We will increase the sampling frequency and fieldwork inspections to monitor the leachate discharge.	Complete. No copper found in leachate.
3.14. Marginal non-compliance with RE4 and significant non-compliance with long term RQO of RE3 on Hornsey Brook – Source to Confluence with Yeo. Investigate the cause of the non-compliance.	Complete. Improvements in water quality have taken place.

8.1. The need for accurate data on waste arisings. Carry out a waste arisings survey as part of a national initiative.	Survey completed. Results contributed to the Regional Strategic Waste Management Assessment (see action 8.2).
10.2. The need to reduce dust and odour from wood-fired boilers at Crosby Ltd., Bridgwater. Our improvement programme requires Crosby to update their process to Best Available Technology Not Entailing Excessive Cost.	The process has changed and is no longer regulated under Integrated Pollution Control.
12.2. The need to review water levels on the Moors, to improve conditions for wildlife, in consultation with all interested parties. Produce First Stage Water Level Management Plan for North Moor Site of Special Scientific Interest.	The North Moor Water Level Management Plan is complete.
12.3. The need to review water levels on the Moors, to improve conditions for wildlife, in consultation with all interested parties. Contribute to Water Level Management Plans for the remaining Sites of Special Scientific Interest in the catchment being produced by the Internal Drainage Boards.	All contributions for Sites of Special Scientific Interest Water Level Management Plans are complete.
12.12. The need to reverse the decline in species and habitat diversity. We will initiate Phase 1 of the headwater streams biodiversity review and report findings.	Phase 1 survey completed and report produced.
13.6. Legislative changes e.g. licence limitation. As a consultee we will contribute to the Ministry of Agriculture, Fisheries and Food's review of the Salmon and Freshwater Fisheries Act.	The review was completed in 2000 and the Government published its response in 2001. Many of the review group recommendations regarding changes in legislation relating to eel fishing have been accepted in principle. Legislative changes would need to be progressed.
17.3. The increase in waste production. Survey waste arisings in the Plan area.	Survey completed. Results contributed to the Regional Strategic Waste Management Assessment (see action 8.2).

4.2. New issues and actions

LEAPs are evolving documents; following the current review 7 new actions have been included, addressing new concerns and reflecting the ongoing development of the plan.

Issue	New Action
Impact of farming activities on water quality	1.17. Assess and map existing data on diffuse pollution to identify gaps in knowledge, identify major sources and inform the way forward *.
Impact of farming activities on water quality	1.18. Set up flow monitoring at all sites where required for load analysis of nutrients to address areas where we currently have insufficient information *.
Impact of farming activities on water quality	1.19. Set up a database of all land spreading activities registered for exemption from Waste Licensing and map the sites used frequently. This will be used to promote better practices in off-farm waste spreading *.
Impact of farming activities on water quality	1.20. Deliver best practice advice via farm visits, leaflets and other media. This will be achieved through partnership working to make

	best use of resources, training and to co-ordinate actions *.
Impact of sewage treatment works on water quality	2.8. Implement a full investigation of the River Isle to address the issue of poor quality effluent arising from a number of sources.
The need for improved flood defence practices in the catchment	15.9. Implement the Review of Flood Management Practices Action Plan, and use it to inform the levy process.
Air quality	18.2. Contribute at area level to the achievement of national targets for improving the Agency's environmental performance (see section 3.8).

Note *: These actions relate to an Agency project to tackle diffuse pollution throughout the North Wessex Area. They are likely to address other issues and actions relating to water quality and biodiversity across the catchment.

4.3. Progress report

The following action tables summarise the Agency's progress to date. Where possible, the costs of actions have been given. Costs are only our estimates of costs to the Agency. They do not indicate that this money has been committed. The costs shown are indicative only, to give an idea of the relative size and resource implications of each action. All costs are given as thousands of pounds (£k) and include an estimation of staff time. The years covered by the plan are represented by a single date. For example, '2001' represents the financial year April 2001 to March 2002. The state of progress of the actions have been identified as:

N	New action	**C**	Completed action
S	Started / ongoing action	**D**	Delayed / no progress

The Agency often works with others to ensure that the actions in this plan are implemented, and so each action identifies the partner organisations involved. The Agency also seeks opportunities to establish new links with other organisations that influence or affect the environment.

Issue 1: Impact of farming activities on water quality

Action 1.1	Progress C
We will carry out a farm pollution campaign and/or the monitoring of consented discharges on Cannington Brook - Blackmore Farm to Bradley Green (significant non-compliance with RE2).	A farm survey was carried out and 10 farms visited (see 2nd Annual Review); this stretch is now compliant with its River Quality Objective.

Action 1.2	Progress C
A farm pollution campaign will be carried out to address marginal non-compliance with RE3 on Cary - Lovington to Higher Farm.	Site visits took place in early 2001 and advice given. This stretch is now compliant.

Action 1.3	Progress S
Make further investigations into the actual sources of pollution following marginal non-compliance with RE2 on Yeo - Milborne Port to upstream Sherborne Lake, and investigate agricultural inputs from Purse Caundle.	This stretch of the River Yeo continues to be non-compliant. Investigations into the contribution of various sources are underway and monitoring data is under review. This action now also incorporates 1.4.
Cost: 4.5k	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leader Environment Protection - Parrett

Action 1.4	Progress C
Agricultural inputs from Purse Caundle will be investigated.	This action is now covered by 1.3 and so has been closed.

Action 1.5	Progress C
A recent farm pollution prevention campaign will be followed up with regulation of farm discharges to Beer Hackett Stream following marginal non-compliance with RE2 on Wriggle - confluence with Beer Hackett Stream to confluence with Yeo.	Monitoring data will be reviewed as normal, but following compliance over the last two years we will not be undertaking a farm campaign or any additional monitoring in this catchment, and the action is therefore complete.

Action 1.6	Progress C
We will investigate sources of agricultural runoff and take steps to reduce inputs to the Closworth Stream - Princes Place to confluence with Sutton Bingham Stream, following historical marginal non-compliance with long term River Quality Objective of RE2.	This stretch has been fully compliant for the last four years and so this action is now closed. We will continue to review monitoring data routinely.

Action 1.7	Progress C
We will promote Code of Good Agricultural Practice (Closworth Stream).	This code is promoted through our routine advisory activities, and as the stream is now compliant, this action is closed. However, see new action 1.20.

Action 1.11	Progress S
We will investigate the sources of nutrient inputs to the Cam, Cary, Hornsey Brook, Stogursey Brook, Cannington Brook, Lam Brook, Upper Parrett, Upper Yeo and tributaries, and take appropriate action depending on the source.	Farm visits have taken place (see 2nd Annual Review. Investigations have been taken under the Somerset Moors and Levels project, and issues have been identified. A nutrient balance computer analysis (Lapwing) is also complete. Improved farm waste management systems have been introduced at Blackmore Farm since 1997, and there has also been continued improvement at Cannington Creamery.
Cost: 4.5k	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leaders Environment Protection - West Somerset & Tone/ Parrett

Action 1.14	Progress S
Continue monitoring at Greinton following non-compliance with European Commission Freshwater Fish Directive total ammonia standard on King's Sedgemoor Drain. Investigate possible sources.	Investigations are continuing. Some survey work has been carried out; some sources have been identified but further work is required. See also action 5.1.
Cost: 6.6k	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leader Environment Protection - Parrett

Action 1.16	Progress C
Investigate cause of exceedence of the Surface Water Abstraction Directive standards for Polyaromatic Hydrocarbons at Ashford Reservoir and take appropriate action.	This is an analytical technique problem and is therefore being closed.
Cost: 0.4k	**Time scale:** -
Action by: Agency	**Contact:** Team Leader Environment Protection - West Somerset & Tone

Action 1.17	Progress N
Assess and map existing data on diffuse pollution to identify gaps in knowledge, identify major sources and inform the way forward.	Some progress has already been made. All sites receiving sewage sludge for spreading are being identified. Water quality, fisheries and biology data has been analysed to define the impact of diffuse pollution in the North Wessex Area, and will be used to draw up a list of area-specific actions. Future action is likely to include identifying and mapping areas of nutrient enrichment of groundwater and soils and soil erosion.
Cost: £0.5k	**Time scale:** 2001-2002
Action by: Agency	**Contact:** Team Leader Environment Protection - Parrett

Action 1.18	Progress N
Set up flow monitoring at all sites where required for load analysis of nutrients to address areas where we currently have insufficient information.	Implementation will depend on the outcome of work under action 1.17 and on the availability of funding.
Cost: Unknown	**Time scale:** 2002-2005
Action by: Agency	**Contact:** Team Leader Environment Protection - Parrett

Action 1.19	Progress N
Set up a database of all land spreading activities registered for exemption from Waste Licensing and map the sites used frequently. This will be used to promote better practices in off-farm waste spreading.	Work has already begun on setting up a database, which will be used to inform the way forward for new action 1.20.
Cost: £4k	**Time scale:** 2001-2005
Action by: Agency	**Contact:** Team Leader Environment Protection - Parrett

Action 1.20	Progress N
Deliver best practice advice through farm visits, advisory leaflets and other media. This will be achieved through partnership working to make best use of resources, training and to co-ordinate actions.	A start has been made discussing common ground with other organisations, identifying where collaboration could be beneficial. Future activity will also focus on the need for funding for regulatory visits to land spreading operations.
Cost: Unknown	**Time scale:** 2001-2005
Action by: Agency, Farming and Wildlife Advisory Group, National Farmers Union, Country Land and Business Association, DEFRA, land agents, Soil Association, Rural Land Use Group	**Contact:** Team Leader Environment Protection - Parrett

Issue 2: Impact of sewage treatment works on water quality

Action 2.1	Progress C
Investigate whether marginal non-compliance with RE2 on Parrett - confluence with Crewkerne Brook to confluence with Broad, is due to Crewkerne East Sewage Treatment Works. If necessary seek improvements to Crewkerne Sewage Treatment Works.	This stretch is now compliant, and so this action is closed. However, see also action 2.5.

Action 2.2	Progress C
Investigate marginal non-compliance with RE3 on Isle - Chard Sewage Treatment Works to Dunlop Farm, which has historically been due to Chard sewage treatment works. New works now operational.	This issue had been resolved (see the 2nd Annual Review). A new issue has risen however, based around poor quality effluent arising from a number of sources on the River Isle - source to Hart Bridge, and is addressed by new action 2.8.

Action 2.3	Progress C
Investigate whether marginal non-compliance with RE2 on Isle - upstream Ilminster Bifurcation to downstream Ilminster Bifurcation is due to the influence of Ilminster Sewage Treatment Works. Desk study to be undertaken. If necessary seek improvements to Ilminster Sewage Treatment Works.	This stretch is now compliant, but see also action 2.2.

Action 2.4	Progress C
Investigate significant non-compliance with River Quality Objective of RE3 (2000) on Hinton Meads Brook - Hurst to confluence with Welhams Brook. Martock Sewage Treatment Works outfall now relocated to the River Parrett.	See 2nd Annual Review - have requested that this stretch be removed from the classification scheme. No further action is necessary and so this action is closed.

Action 2.5	Progress S
Investigate whether marginal non-compliance with RE3 on Crewkerne Brook - Crewkerne to confluence with Parrett, is due to Crewkerne East Sewage Treatment Works. If necessary seek improvements to Crewkerne Sewage Treatment Works.	This stretch is now significantly non-compliant. Work is scheduled under Asset Management Plan 3, and is progressing to the planned completion date (2002).
Cost: £6.6k	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leader Environment Protection - Parrett

Action 2.6	Progress C
Investigate whether marginal non-compliance with RE2 on Cannington Brook - Cannington to confluence with tidal Parrett, is due to Cannington Sewage Treatment Works. Desk study to be undertaken. If necessary seek improvements to Cannington Sewage Treatment Works.	Cannington Sewage Treatment Works is included in AMP3, and works were completed March 2001. The stretch is now compliant with its River Quality Objective.

Action 2.7	Progress C
Assess risk of North Petherton Sewage Treatment Works causing non-compliance with RE3 on Petherton Stream - North Petherton to confluence with tidal Parrett in the future.	North Petherton Sewage Treatment Works is included in Asset Management Plan 3. Works are due to be completed by December 2001, and the stretch is now compliant.

Action 2.8	Progress N
Implement a full investigation of the River Isle to address the issue of poor quality effluent arising from a number of sources.	This action also replaces actions 2.2 and 2.3.
Cost: £4.4k	**Time scale:** 2001-2004
Action by: Agency	**Contact:** Team Leader Environment Protection - Parrett

Issue 3: Unknown causes of poor water quality

Action 3.2	Progress C
Investigate the cause of the marginal non-compliance with RE3 on Cary - Somerton Sewage Treatment Works to Henley.	A report was produced February 2000 (see 2nd Annual Review). The stretch is now compliant with its River Quality Objective.

Action 3.3	Progress S
Investigate the cause of the significant non-compliance with RE2 on Isle - confluence with Fivehead to confluence with Parrett.	Samples are now taken at variable times throughout the day, and the results are monitored. The availability of a reasonable database of results may help provide a solution to this problem. A review of existing consents may be carried out if this should prove necessary, although there has been some improvement as the stretch is no longer significantly failing to achieve RE2.
Cost: 0.4k	**Time scale:** 2000-2003
Action by: Agency	**Contact:** Team Leader Environment Protection - Parrett

Action 3.4	Progress C
Investigate the cause of the marginal non-compliance with RE2 on Fivehead River - Hatch Beauchamp to confluence with Blackwater Tributary.	This stretch is now compliant with its River Quality Objective.

Action 3.5	Progress S
Marginal non-compliance with RE2 on Fivehead River - Hatch Green/Blackwater Tributary confluence to confluence with Isle.	A review of monitoring results, rainfall data and discharge data is necessary to draw any conclusions at this site; this review is yet to be completed.
Cost: 0.4k	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leader Environment Protection - Parrett

Action 3.6	Progress C
Investigate the cause of the marginal non-compliance with RE2 on Merriot Stream - upstream Hinton Park Farm to confluence with Parrett.	This stretch is now compliant with its River Quality Objective.

Action 3.7	Progress C
Investigate the cause of the marginal non-compliance with RE2 on Fiddington Brook - source to Hornhill.	No further action required as this stretch is now compliant with its River Quality Objective.

Action 3.8	Progress C
Investigate the cause of the marginal non-compliance with RE2 on Cannington Brook - Ashford Reservoir to Blackmore Farm.	This stretch is no longer failing to comply with its River Quality Objective.

Action 3.11	Progress C
Investigate the cause of the significant non-compliance with RE2 on Cobbs Cross Stream - Goathurst downstream Knoll Farm to confluence with Parrett.	This stretch has been compliant since it last failed in 1997.

Action 3.12	Progress C
Investigate the cause of the marginal non-compliance with RE2 on Sutton Bingham Stream - Higher Halstock to downstream Sutton Bingham Reservoir.	It is considered that a farm campaign is not required at this time as the stretch is now compliant. However, all results will continue to be monitored closely.

Action 3.13	Progress S
Investigate the cause of the significant non-compliance with RE3 on the Back Brook - downstream Dimmer Waste Disposal Site to confluence with Cary.	Investigations were carried out early 2001 and two point sources affecting the Back Brook have been identified. This stretch is no longer significantly non-compliant, but is marginal.
Cost: 4.4k	**Time scale:** 2000-2001
Action by: Agency	**Contact:** Team Leader Environment Protection - Parrett

Issue 4: Impact of industrial discharges on water quality

Action 4.1	Progress C
We will carry out a survey to address marginal non-compliance with RE2 on Cannington Brook - Bradley Green to Cannington, including visiting a potato grading plant.	A farm survey was undertaken (see 2nd Annual Review). Improvements have also been made at the potato grading plant, and the stretch is now compliant.

Action 4.2	Progress S
Address the effect on the tidal River Parrett of combined discharges from the UCB Cellophane site in Bridgwater, through the reduction of sulphide content of discharge at source by March 1998, under Integrated Pollution Control.	Low tide results saw a substantial reduction in the sulphide concentrations in the vicinity of the discharge and further downstream when compared to the last survey in September 1998.
Cost: 0	**Time scale:** 2000-2002
Action by: Agency, UCB Cellophane	**Contact:** Team Leader Environment Protection - Parrett

Action 4.3	Progress C
Separation and re-routing of sewage and non-UCB effluents is being examined for feasibility and costs, to address the effect on the tidal River Parrett of combined discharges from the UCB site in Bridgwater.	Separation of sewage and non-UCB effluent has now been completed. Sewage from the site is now routed to Bridgwater STW.

Action 4.4	Progress C
Continue to assess the impact of combined discharges from the UCB site on the tidal River Parrett to confirm UCB modelling conclusions.	This action will now be addressed under 4.3.

Action 4.5	Progress C
Achieve further reductions in UCB effluent discharging to the tidal Parrett to meet Best Available Technique Not Entailing Excessive Cost under Integrated Pollution Control.	Consent for the final discharge has been issued (see 2nd Annual Review).

Action 4.6	Progress S
We will liaise with South Somerset District Council and the Ninespring Steering Group to consider the provision of a semi-permanent oil boom on the Dodham Brook in 1999-2000 to address oil pollution problems, under Integrated Pollution Control.	Liaison with South Somerset District Council has taken place. This action is currently awaiting a response from the Agency's South West Region Office regarding health and safety considerations.
Cost: 1.1k	**Time scale:** 2000-2004
Action by: Agency, UCB Cellophane	**Contact:** Team Leader Environment Protection - Parrett

Issue 5: Impact of penning, low flow, nutrient enrichment, algal and weed growth

Action 5.1	Progress S
Investigate the relative contributions of low flows, duckweed and high temperature to low dissolved oxygen. Take appropriate action to address significant non-compliance with RE3 on King's Sedgemoor Drain - Henley to confluence with 18 Feet Rhyne.	Compliance of this stretch with RE3 is now marginal. The catchment will be investigated under the Levels and Moors Project, which includes an action to develop a water quality model for the whole catchment. This will help focus resources and also help us review consents under the Habitat Regulations.
Cost: £5k	**Time scale:** 2000-2002
Action by: Agency	**Contact:** Team Leader Environment Protection - Parrett

Action 5.2	Progress S
Monitor the results of a large pollution prevention campaign that was recently completed in the catchment, which will also address significant non-compliance with RE3 on King's Sedgemoor Drain - confluence with 18 Feet Rhyne to confluence with Sowy. Various improvements to water quality should be seen throughout the catchment.	This stretch is still significantly failing to comply with RE3. The catchment will be investigated under the Levels and Moors Project, which includes an action to develop a water quality model for the whole catchment. This will help focus resources and also help us review consents under the Habitat Regulations.
Cost: £4k	**Time scale:** 2000-2002
Action by: Agency	**Contact:** Team Leader Environment Protection - Parrett

Action 5.3	Progress S
Promote new buffer strips and marginal reedbeds to help remove nutrients from agricultural runoff following marginal non-compliance with RE3 on King Sedgemoor Drain - Dunball to confluence with Parrett.	This stretch is now significantly failing to achieve RE3. This action is being addressed across a wider area through the Somerset Levels and Moors Strategy and Action Plan. The Mid Parrett project is also underway. See also section 2.2 and action 12.8 Rivers and Streams.
Cost: 0	**Time scale:** 2001-2004
Action by: Agency, Farming and Wildlife Advisory Group, Somerset Wildlife Trust	**Contact:** Team Leader Conservation

Action 5.4	Progress S
Concerns have been expressed by Wessex Water that Durleigh reservoir may be at risk from nitrate enrichment.	A pollution prevention survey was carried out in 1997 over the Durleigh catchment , specifically aimed at nitrate and pesticide runoff, and advice given. Further investigations to follow.
Cost: 1k	**Time scale:** 2000-2002
Action by: Agency, Farming & Wildlife Advisory Group, DEFRA	**Contact:** Team Leader Environment Protection - West Somerset & Tone

Action 5.5	Progress S
We will investigate the reason for duckweed proliferation and its impact on water quality especially in the Somerset Levels and Moors	We have identified at least two priority locations to address low water levels and works are planned 2001/02. Widespread water quality investigations and campaigns are currently happening, including work in West Sedgemoor, Curry Moor and Southlake Moor, which should address this issue.
Cost: £40k (for all actions)	**Time scale:** 2001-2005
Action by: Agency, English Nature, RSPB, Somerset Wildlife Trust	**Contact:** Somerset Levels and Moors Project Officer

Action 5.6	Progress C
Identify the extent of watercourses that would benefit from a change in regime and examine ways in which the fisheries habitat can be improved without compromising the interests of other users, and where possible implement changes to water level management.	This action has been considered as part of the Agency's Review of Flood Management Practices.

Action 5.7	Progress C
Investigate the cause of low dissolved oxygen causing significant non-compliance with RE3 on Hinton Meads Brook - Fosseway to Hurst.	See 2nd Annual Review - have requested that this stretch be removed from the classification scheme. No action is necessary and so this action is closed.

Action 5.8	Progress S
We will carry out extra monitoring as planned to investigate the extent of eutrophication to address non-compliance with European Commission Freshwater Fish Directive dissolved oxygen standard on River Cary - King's Sedgemoor Drain.	Investigations have been undertaken under the Somerset Moors and Levels project, and issues identified. A nutrient balance computer analysis (Lapwing) has also been completed.
Cost: £0.5k	**Time scale:** 2000-2002
Action by: Agency	**Contact:** Team Leader Environment Protection - Parrett / West Somerset & Tone

Issue 6: Inappropriate location of monitoring points

Action 6.1	Progress C
We will investigate the causes of low dissolved oxygen following significant non-compliance with RE3 on Durleigh Brook - upstream Durleigh Reservoir to confluence with Parrett.	This stretch is now compliant and has not failed since 1998.

Action 6.2	Progress S
Review location of monitoring point following marginal non-compliance with RE2 on the following stretches: Fivehead - Blackwater to confluence with Hatch Green Tributary.	The monitoring points are currently under review. Awaiting further monitoring data.
Cost: £0.26k	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leader Environment Protection - Parrett

Action 6.3	Progress C
Review location of monitoring point following marginal non-compliance with RE2 on Parrett Tributary - Parrett Tributary Bagnell Farm to confluence with Parrett.	This stretch is now compliant with its River Quality Objective.

Action 6.4	Progress C
Review location of monitoring point following marginal non-compliance with RE2 on Merriot Stream Tributary - Maincombe to confluence with Merriot Stream.	This stretch is now compliant with its River Quality Objective.

Action 6.5	Progress S
Review location of monitoring point following marginal non-compliance with RE2 on the following stretches: Stogursey Brook - Stogursey to confluence with Dodington Tributary.	The monitoring point has been re-located and RE failure is probably due to winter rainfall and diffuse sources of pollution. We will continue to examine the data to establish any possible trends.
Cost: £0.5k	**Time scale:** 2000-2001
Action by: Agency	**Contact:** Team Leader Environment Protection West Somerset & Tone

Action 6.6	Progress S
Review location of monitoring point following marginal non-compliance with RE2 on Stogursey Brook - Stogursey to confluence with Stringston Tributary.	As 6.5
Cost: £0.5k	**Time scale:** 2000-2001
Action by: Agency	**Contact:** Team Leader Environment Protection West Somerset & Tone

Action 6.7	Progress S
Review location of monitoring point. Following marginal non-compliance with RE2 on Stogursey Brook - Stringston / Dodington Tributary Confluence to Sea.	As 6.5
Cost: £0.5k	**Time scale:** 2000-2001
Action by: Agency	**Contact:** Team Leader Environment Protection West Somerset & Tone

Action 6.8	Progress S
Biological class d site on the Stogursey Brook at Stolford Bridge. Review location of monitoring point.	This action was previously reported as complete (see 2nd Annual Review). However, recent Nitrogen Dioxide levels mean further work is required at Stogumber. Due to Foot and Mouth restrictions this has yet to take place.
Cost: 0	**Time scale:** 2001 - 2002
Action by: Agency	**Contact:** Team Leader Environment Protection West Somerset & Tone

Issue 7: The need to review all authorisations and actions, as required by The Natural Habitats Regulations, which are likely to have a significant effect on a Natura 2000 site.

Action 7.1	Progress S
Review current and new consents to discharge in relation to Natura 2000 sites in the catchment.	The assessment of new consents to discharge is underway. We have also identified which existing consents require further input. A Conservation Officer (Habitats Directive) has been appointed to take this action forward (see section 3.1).
Cost: £10k	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leader Conservation

Action 7.2	Progress S
Review current and new abstraction licences in relation to Natura 2000 sites in the catchment.	The assessment of new abstraction licences is underway. See action 7.1.
Cost: £10k	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leader Conservation

Action 7.3	Progress S
Review impact of current and new operational activities in relation to Natura 2000 sites in the catchment.	The assessment of new operational activities is underway. See action 7.1.
Cost: £10k	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leader Conservation

Issue 8: The need for accurate data on waste arisings

Action 8.2	**Progress C**
We will produce strategic waste management assessments for the use of local authorities in the North Wessex Area.	The South West Regional Strategic Waste Management Assessment (SWMA) was produced in December 2000, and is now available to Local Authorities and other involved in waste management.

Issue 9: The need for waste minimisation and improved waste management

Action 9.1	**Progress S**
Participate in waste reduction initiatives e.g. Somerset Waste Minimisation Group.	This is an ongoing action identified under waste minimisation campaigns for the financial year 2001. We currently provide secretarial support to the steering group of the Somerset Environmental Business Initiative
Cost: £0.6k	**Time scale:** 1999-2002
Action by: Agency	**Contact:** Team Leader Tactical Planning

Action 9.2	**Progress S**
Provide advice and guidance on waste minimisation and support initiatives.	Provision of waste minimisation advice and guidance to local groups is ongoing. We supported the Somerset Waste Management Best Value Review process and provide administration support to the Somerset Environmental Business Initiative.
Cost: £0.6k	**Time scale:** 1999-2002
Action by: Agency, Local Authorities, Local Agenda 21 Groups	**Contact:** Team Leader Tactical Planning

Issue 10: Emissions to air from UCB Cellophane Ltd

Action 10.1	**Progress S**
Reduce emissions to air including the unpleasant odour from UCB Cellophane Ltd. Although progress has been made, investigations by UCB into further reductions are required.	Progress has been assessed by the Agency in the statutory review of the Integrated Pollution Control (IPC) process (see the 2nd Annual Review). Improvements are now being sought into reductions in releases of sulphur dioxide and trioxide.
Cost: £1k	**Time scale:** 2000-2001
Action by: UCB Cellophane, Agency	**Contact:** Team Leader PIR/RSR

Issue 11: The need to improve water resource management in the catchment

Action 11.1	**Progress S**
Investigate the possibility of fine tuning the take of water from the River Parrett to the Moors.	This action is being evaluated as part of the Review of Flood Management Practices; the Consultation Draft was published April 2001.The Catchment Abstraction Management Strategy for the Parrett (due to start in 2003) will also have a bearing on this issue.
Cost: £10k	**Time scale:** 2000-2005
Action by: Agency, Internal Drainage Boards.	**Contact:** Somerset Levels and Moors Project Officer

Action 11.2	**Progress C**
Carry out an investigation into the need for, and feasibility of, providing a gauging station downstream of Langport and produce a report.	The review of the need for flow data at Langport concluded there is no need for data at this site. However, the need for flow data further downstream (Bridgwater) is still unresolved and depends on other developments. (see 11.6)
Cost: £2k	**Time scale:** 2000-2004
Action by: Proposed consultancy study	**Contact:** Team Leader Water Resources

Action 11.3	**Progress S**
Review impact of Ashford Reservoir on downstream water interests and act according to findings to address reduced flow downstream of the Reservoir.	The collection of field data is continuing.
Cost: £10k	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leader Water Resources

Action 11.4	**Progress D**
Investigate low flow issue on King's Sedgemoor Drain and act according to findings.	No progress; this is a low priority issue. Rescheduled.
Cost: £10k	**Time scale:** 2003-2005
Action by: Agency, licence holders	**Contact:** Team Leader Water Resources

Action 11.5	**Progress S**
Develop and document an operational strategy to minimise the impact of releases from Sherborne Lake on River Yeo water quality.	Ecological monitoring is starting in 2001 to establish baseline conditions in the River Yeo.
Cost: £1k	**Time scale:** 2001-2004
Action by: Agency, Wessex Water	**Contact:** Team Leader Water Resources

Action 11.6	**Progress N**
Carry out an investigation into the need for, and feasibility of, providing a gauging station in Bridgwater.	
Cost: £2k	**Time scale:** 2000-2004
Action by: Proposed consultancy study	**Contact:** Team Leader Water Resources

Issue 12: The need to maintain and enhance biodiversity

Action 12.1	**Progress S**
Review and update our Water Level Management and Nature Conservation Strategy on the Levels and Moors to improve conditions for wildlife, and consult with interested parties.	While we have almost completed a review of our practices in respect of the Habitats Regulations (see section 3.1), changes in legislation (especially the Countryside and Rights of Way Act - section 3.12) will require a similar review for RAMSAR and SSSI features by 2004. This issue is more fully covered by the Somerset Levels and Moors Water Level Management Action Plan. The Catchment Abstraction Management Strategy (CAMS) process (section 3.3) will also impact on this issue.
Cost: £6k	**Time scale:** 2000-2004
Action by: Agency, DEFRA, Internal Drainage Boards, English Nature, RSPB, Somerset Wildlife Trust, Somerset County Council, National Farmers Union, Country Landowners Association, Levels and Moors Partnership, English Heritage, Landowners & Managers	**Contact:** Somerset Levels & Moors Project Officer

Action 12.4	Progress C
Seek opportunities to engineer water levels within the Levels and Moors Special Protection Area (SPA), to achieve English Nature's target conservation objectives.	The construction of Moorlinch Raised Water Level Area was completed during the summer 2001. Other works are proposed for extending the Raised Water Level Areas at Northmoor and Westmoor, and we will be looking to take these schemes forward through the implementation of Water Level Management Plans (see also section 3.2). This will help reach the target set by English Nature for splash flooding.
Cost: £100k p.a	**Time scale:** 2000-2003
Action by: Agency, DEFRA, farmers	**Contact:** Flood Defence Projects Officer

Action 12.5	Progress S
Undertake a study of how to achieve English Nature's minimum requirements for ditch depth in their conservation objectives for designated moors.	This action is included in the Somerset Levels and Moors Water Level Management Action Plan (action 2.5). We are exploring options for addressing priority issues with the Internal Drainage Boards.
Cost: £150k	**Time scale:** 2000-2003
Action by: Agency, Internal Drainage Boards, English Nature	**Contact:** Flood Defence Projects Officer

Action 12.6	Progress S
Continue to support monitoring to assess the effect of Raised Water Level Areas on bird numbers and grassland composition on the Levels and Moors. Continue our work to monitor water quality in the rhyne and ditch systems of Sites of Special Scientific Interest to ensure the maintenance of favourable conservation status.	This action is addressed by the Somerset Levels and Moors Water Level Management Action Plan. We have been reviewing river quality data to increase our understanding of the input of nutrients to the moors from the main river catchments. We have not yet reported the nutrient budget, which is proving to be a bigger task than anticipated. We are looking to commission work in 2001-2002, and are exploring options for nutrient budgeting and modelling with the Universities of Reading and Liverpool.
Cost: £60k	**Time scale:** 2000-2002
Action by: Agency, English Nature, RSPB, Internal Drainage Boards	**Contact:** Team Leader Conservation

Action 12.7	Progress S
Continue to work with others to establish local biodiversity targets and monitor progress.	The collaborative project in the River Parrett Mid-Water Streams Project has now started, and forms part of a wider strategy taking in the Tone and Brue (see section 2.2).
Cost: £5k	**Time scale:** 2001-2004
Action by: Agency, English Nature, RSPB, Wildlife Trusts, local authorities	**Contact:** Team Leader Conservation

Action 12.8	Progress S
Help to implement action plans for Agency contact species to reverse the decline in species and wetland habitat diversity:	The Agency is the contact point for Greater water parsnip, Cut grass, and the following species and habitats that occur in the catchment.
Otter:	We continue to collect corpses of road casualties for autopsy, providing information on distribution. Several corpses were collected from the catchment last year.
Water vole:	Relevant information regarding the species will be provided to riparian owners and managers through the River Parrett Mid-Water Streams Project (see section 2.2).
Depressed river mussel:	We are awaiting a report from Cambridge University which includes investigating improvements to weed-cutting machinery.
Hairy click beetle:	A survey for this species has been completed and revealed a distribution almost identical to 1992, but also identified one new site. An experimental fence has also been completed to limit grazing and encourage Canary reed grass habitat adjacent to existing known beetle sites.
Rivers and streams:	We continue to assess the impact of development and land use activities, and will work in partnership with Internal Drainage Boards to achieve sympathetic management through the Parrett Mid-Waters Project.
Cost: Unknown	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leader Conservation

Action 12.9	Progress S
Promote buffer strips to improve water quality and enhance river corridor habitat diversity.	See Action 12.8 Rivers and Streams.

Action 12.10	Progress S
Continue to work with highways authorities to ensure underpasses etc. for otters are installed on new roads.	No further progress.
Cost: £0.5k	**Time scale:** 2000-2004
Action by: Agency, local authorities, highways authorities	**Contact:** Team Leader Conservation

Action 12.11	Progress D
Seek to persuade the Ministry of Agriculture, Fisheries and Food (now DEFRA) to designate new signal crayfish no-go areas.	No progress.
Cost: £0	**Time scale:** 2000-2004
Action by: Agency, DEFRA	**Contact:** Team Leader Conservation

Action 12.13	Progress C
Set an example in reducing emissions from vehicles used on Agency business; reducing aerial deposition of nitrogen and ammonia, which have a detrimental effect on wildlife particularly on the peat soils of the Somerset Moors.	Mileage is about 5% over the target figure. Fuel efficiency has remained at the same level. We will continue to work to reduce business mileage and will be setting new targets for the coming year, covered by new action 18.2.

Action 12.14	Progress S
Contribute to national initiatives to reduce oxides of nitrogen and sulphur emissions from power stations, which have a detrimental effect on wildlife particularly on the peat soils of the Somerset Moors.	Emissions have been reduced through the increased use of low nitrogen oxide burners, and a decrease in the use of heavy fuel oil, achieved through Integrated Pollution Control (IPC) regulation.
Cost: £0.5k	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leader PIR/RSR

Action 12.15	Progress C
Ensure emissions of nitrogen and ammonia to air from major industries are reduced by means of improvement programmes agreed as part of Integrated Pollution Control authorisations.	This action is dealt with by the Agency's normal regulatory work, and so no specific action has been taken in the catchment (see also action (12.14). Air pollution is being tackled elsewhere which may impact on this area.

Action 12.16	Progress S
Identify priority degraded stretches for channel restoration using River Habitat Surveys. Seek funds to implement projects.	We will be targeting the River Isle for River Habitat Survey in 2001-2002. This has so far been delayed due to Foot and Mouth Disease restrictions.
Cost: £15k	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leader Conservation

Action 12.17	Progress S
We will work closely with other organisations including the Ministry of Agriculture Fisheries and Food, Internal Drainage Boards and the Farming and Wildlife Advisory Group to raise awareness of the damage that can be caused by unrestricted livestock access to streams.	See 12.8 Rivers and Streams. The Parrett Catchment is now a target area for the Countryside Stewardship Scheme (see section 2.2).
Cost: £0	**Time scale:** 2000-2004
Action by: Agency, DEFRA, Internal Drainage Boards, Farming and Wildlife Advisory Group, Somerset Wildlife Trust	**Contact:** Team Leader Conservation

Action 12.18	Progress D
We will investigate the extent of the problem of fish loss at sluices and other water control structures, and if substantiated we may need to incorporate modifications at some structures.	No further progress from last year.
Cost: £0.5k	**Time scale:** 2000-2001
Action by: Agency	**Contact:** Team Leader Fisheries

Action 12.19	Progress S
We will identify opportunities for habitat improvement and creation to increase the number of fish refuge areas in the lowland catchment by working with riparian owners and other interested parties. In particular there may be opportunities to undertake this type of work during routine Environment Agency maintenance where landowners are in agreement.	As last year, no specific projects have been identified in this catchment.
Cost: £0.2k	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leader Fisheries

Action 12.20	Progress S
We will review the extent of fisheries designations under the European Commission Freshwater Fish Directive as it applies to the Isle and its tributaries.	North Wessex Area has recommended extra designations to Regional Water Quality. The decision whether to designate is now with the Agency's Head Office and DEFRA.
Cost: £2k	**Time scale:** 2000-2001
Action by: Agency	**Contact:** Team Leader Fisheries

Action 12.21	Progress N
Produce a Catchment Abstraction Management Strategy (CAMS) for the Parrett catchment taking wildlife needs into account.	Due to start in 2003.
Cost: £35k	**Time scale:** 2003-2009
Action by: Agency,	**Contact:** Team Leader Water Resources Licensing

Action 12.22	Progress D
Seek opportunities to extend the Raised Water Engineer Water Level Area at Northmoor through the implementation of Water Level Management Plans. This will help to reach the target set by English Nature for splash flooding.	Delayed due to flooding in Northmoor, during winter 2000/2001.
Cost: £40 p.a	**Time scale:** -
Action by: Agency, DEFRA, farmers	**Contact:** Flood Defence Projects Officer

Action 12.23	Progress N
Seek opportunities to extend the Raised Water Engineer Water Level Area at Westmoor through the implementation of Water Level Management Plans. This will help to reach the target set by English Nature for splash flooding.	Consultants engaged to progress detailed design. Negotiation is ongoing with Internal Drainage Boards and landowners.
Cost: £40k p.a	**Time scale:** 2002-2003
Action by: Agency, DEFRA, farmers	**Contact:** Flood Defence Projects Officer

Issue 13: Eel and elver fishery

Action 13.1	Progress S
Review of obstructions to elver migration.	Within the Somerset Levels and Moors Project we are looking at making some structures, such as tilting weirs, more passable to small eels by attaching artificial media to the weir structure sidewalls.
Cost: £2k	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leader Fisheries

Action 13.2	Progress C
Assess adult eel stock in routine fisheries surveys.	A national eel management strategy was produced during 2001. Surveys will continue as routine.

Action 13.3	Progress S
Address the alleged decline in eel and elver stock through national Research and Development project.	The R&D Technical Report 'Eel and Elver Stocks in England and Wales; status and management options' was produced in 2001. This has reviewed current and historical datasets across the country. Though there does appear to be evidence for declines in glass eel recruitment and catches of yellow/silver eels, assessing changes in eel stocks has been hampered by a lack of good quality data. In the South West, where the rivers are generally shorter, the data appears to show that the lower reaches receive sufficient recruitment to meet carrying capacities.
Cost: £50k	**Time scale:** 2000-2001
Action by: Agency	**Contact:** Team Leader Fisheries

Action 13.4	Progress S
Review eel licence duties.	A national review of eel licence duties and bylaws has occurred and this is awaiting ratification with the board and then DEFRA after formal advertising; it is hoped these will be confirmed for next year.
Cost: £0.5k	**Time scale:** 2000-2002
Action by: Agency	**Contact:** Team Leader Fisheries

Action 13.5	Progress S
Liaise with police and parish councils to address disturbance/vandalism of property and structures.	There is ongoing liaison with the police.
Cost: £0.5k	**Time scale:** 2000-2004
Action by: Agency, police, parish councils	**Contact:** Team Leader Fisheries

Issue 14: The need to maintain and enhance river corridor landscapes

Action 14.1	Progress S
We will work closely with other organisations to raise awareness of the value of riverside trees, and encourage tree planting adjacent to certain reaches of the Rivers Isle and Cary, tributaries of the Parrett and lower reaches of some of the Quantock streams.	This action will be achieved through the Parrett Mid-Waters Project (see section 2.2).
Cost: £0.5k	**Time scale:** 2000-2004
Action by: Agency, DEFRA, Internal Drainage Boards, Farming and Wildlife Advisory Group, Wildlife Trusts	**Contact:** Team Leader Conservation

Issue 15: The need for improved flood defence practices in the catchment

Action 15.1	Progress S
Develop a Flood Management Practices Action Plan for the Somerset Levels and Moors.	The draft consultation report on flood management practices on the Levels and Moors south of the Poldens was published April 2001. At the end of the consultation period an action plan will be published (see also section 3.2).
Cost: £20k	**Time scale:** 2001-2002
Action by: Agency	**Contact:** Team Leader Flood Defence Strategic Planning

Action 15.2	Progress S
Develop the hydraulic model for the Parrett/Tone system.	The hydraulic model for the Tone and Parrett catchments has been produced. While parts of the model are being used for the Review of Flood Management Practices, further calibration is needed to increase reliability.
Cost: £70k + £20k p.a.	**Time scale:** 2001-2004
Action by: Agency	**Contact:** Team Leader Flood Defence Operations

Action 15.3	Progress C
Use the Flood Defence Management System to draw up prioritised list of defence maintenance requirements and start implementation of the resulting programme.	Implementation of the programme produced as a result of the Flood Defence Management System is underway.

Action 15.4	Progress S
Improve the operation of the Parrett Relief Channel (Sowy River).	Further studies, negotiations and then construction are proposed in the Review of Flood Management Practices (see also action 15.2).
Cost: £4.1k	**Time scale:** 2002-2007
Action by: Agency, English Nature, Internal Drainage Boards, Somerset Wildlife Trust	**Contact:** Team Leader Flood Defence Operations

Action 15.5	Progress S
Need to establish a justifiable de-silting frequency for the Parrett and Tone.	Further studies are proposed in the Review of Flood Management Practices (see action 15.2).
Cost: £55k	**Time scale:** 2001-2006
Action by: Agency	**Contact:** Team Leader Flood Defence Operations

Action 15.6	Progress S
The need to improve the efficiency and effectiveness of pumping station operation. Introduce a scheme of planned maintenance and capital refurbishment.	The Review of Flood Management Practices proposes a programme of refurbishment.
Cost: £3.83 million	**Time scale:** 2006-2009
Action by: Agency	**Contact:** Team Leader Flood Defence Improvements

Action 15.7	Progress C
The need to protect urban areas to current standards (usually 1 in 100 year flood event); undertake a full catchment drainage model and develop appropriate surface water drainage policies for urban areas.	Section 105 modelling has been completed, and will input to the Catchment Flood Management Planning process (see section 3.2).

Action 15.8	Progress S
Review the effects of intensive routine maintenance on aquatic biota, using results of recent study. Where river reaches are over-serviced, relax maintenance regime to retain marginal vegetation and avoid disturbing the bed. Where this is not possible, consider re-modelling channel to create marginal habitats and greater capacity.	The Habitats Directive requires that we review the impact of maintenance in relation to Natura 2000 sites (see section 3.1). The current status of the Moors is currently being assessed, and requirements to achieve favourable status are being agreed with English Nature. The next stage is to consider options to achieve favourable status.
Cost: £0.5k	**Time scale:** 2000-2001
Action by: Agency	**Contact:** Team Leader Flood Defence Improvements

Action 15.9	Progress N
Implement the Review of Flood Management Practices Action Plan, and use it to inform the levy process. Actions 15.1, 15.2, 15.4, 15.5 and 15.6 will also be covered by the Action Plan.	The draft consultation report on flood management practices on the Levels and Moors south of the Poldens was published April 2001. At the end of the consultation period an action plan will be published (see also section 3.2).
Cost: £25 million	**Time scale:** 2002-2015
Action by: Agency	**Contact:** Team Leader Flood Defence Strategic Planning

Issue 16: The need to take account of recreation in Agency work

Action 16.1	Progress C
Produce Conservation and Recreation Management Plans for Agency land in this catchment.	The King's Sedgemoor Drain plan is now out to internal consultation.
Cost: £5k p.a	**Time scale:** 2000-2001
Action by: Agency	**Contact:** Team Leader Conservation

Action 16.2	Progress N
Produce Conservation and Recreation Management Plans for Agency land at Langacre / Sowy / Willow Farm.	This plan is currently being prepared.
Cost: £5k p.a	**Time scale:** 2001-2002
Action by: Agency	**Contact:** Team Leader Conservation

Issue 17: Development pressure

Action 17.1	Progress S
Work in partnership with local authorities to improve environmental protection policies and work towards more sustainable development.	Liaison with local authorities, especially through the Local Development Plan process, is ongoing.
Cost: £1.5k	**Time scale:** 2000-2004
Action by: Agency, local authorities	**Contact:** Team Leader Planning Liaison

Action 17.2	Progress C
Work with Wessex Water to ensure that future needs for water supply and disposal can be sustained without unacceptable impact on the environment.	Wessex Water submitted the first annual review of their water resources plan in 2000. The Agency published its Water Resources Strategy for the South West (section 3.11) in March 2001.

Action 17.4	Progress S
Seek the earliest possible discussions with the local planning authorities and new road developers to advise on the best environmental options for each scheme.	The Agency has been involved with a strategic initiative 'London to South West and South Wales Multi-Modal Study' (SWARMMS); a study looking at road, rail, water and air transport links into the region. The Agency has also been involved in discussions over the Bridgwater Northern Distributor Road.
Cost: £0.5k	**Time scale:** 2000-2004
Action by: Agency	**Contact:** Team Leader Planning Liaison

New Issue 18: Air quality

Action 18.1	Progress S
Report local authority air quality monitoring results in LEAP Annual Reviews.	Results were reported in the 2nd Parrett Annual Review May 2000.
Cost: £0	**Time scale:** 2000-2004
Action by: Agency, Local Authorities	**Contact:** Team Leader LEAPs

Action 18.2	**Progress N**
Contribute at area level to the achievement of national targets for improving the Agency's environmental performance (see section 3.8).	
Cost: Unknown	**Time scale:** 2001-2004
Action by: Agency	**Contact:** Area Business Services Manager

5. River Quality

5.1. River Quality Objectives

We manage water quality by setting targets called River Quality Objectives (RQO). They are intended to protect current water quality and future use, and we use them as a basis for setting consents for new discharges and planned future quality improvements. River Quality Objectives are assigned to all significantly sized rivers based on river flow.

River Quality Objectives are based on the River Ecosystem Classification Scheme that consists of five classes. It sets standards for dissolved oxygen, biochemical oxygen demand, total ammonia, free ammonia, pH, dissolved copper and total zinc. Class RE5 has lower limits and does not in any way denote the worst water quality possible.

Figure 8: River Ecosystem (RE) classification

River Quality Objective	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

In some cases we may manage water by setting Long Term River Quality Objectives. These must be realistic and are set where clear actions can be identified to bring about necessary improvements in water quality or to restore water quality to a former level, but no date is set for their achievement. Where Long Term River Quality Objectives are set, we measure compliance against River Quality Objectives, but use the Long Term River Quality Objectives as a basis for the setting of consents for new discharges, thus ensuring that these will not compromise the eventual achievement of Long Term River Quality Objectives.

We show failures to achieve River Quality Objectives as significant and marginal failures. Significant failures are those where we are 95% certain that the river stretch has failed to meet its River Quality Objective. Marginal failures are those where we are less certain (between 50% and 95%) that the stretch has failed to meet its River Quality Objective.

Figure 9 gives the compliance for all monitored stretches in the Parrett catchment. Where significant or marginal failures have occurred, the cause has been identified. The main determinands of non-compliance in the catchment are Biochemical Oxygen Demand (BOD), Dissolved Oxygen (DO) and Un-ionised Ammonia (UNH3).

These are also the main causes of significant failures across the whole of the North Wessex area, together with Total Ammonia (NH3). Dissolved oxygen was the determinand that caused the greatest number of significant failures across the area (40.7%), and biochemical oxygen demand was second (36.6%).

Figure 9: Long Term River Quality Objective (RQO) compliance 1997-1999

River name	Stretch Name	Stretch No.	Long Term River Quality Objective	Compliance 1997 - 1999
Stogursey Brook	Stringston - Confluence with Dodington Tributary	1	2	Significant failure (BOD)
	Dodington - Stogursey	2	2	Compliant
	Stogursey - Confluence with Stringston Tributary	3	2	Marginal fail (BOD)
	Stringston/Dodington Tributary Confluence - Sea	4	2	Significant fail (BOD)
Parrett	Confluence with Crewkerne Brook - Confluence with Broad	5	2	Compliant
	Confluence with Broad - Confluence with Merriot Stream	6	2	Compliant
	Confluence with Merriot Stream - Confluence with Chinnock Brook	6	2	Compliant
	Confluence with Chinnock Brook - Confluence with Lopen Brook	7	2	Compliant
	Confluence with Lopen Brook - Upstream Petherton Brook	8	2	Compliant
	Upstream Petherton Brook - Martock Weir	8	2	Compliant
	Martock Weir - Confluence with Lam Brook	8	2	Compliant
	Confluence with Lam Brook - Confluence with Wellhams Brook	8	2	Compliant
	Confluence with Wellhams Brook - Kingsbury Episcopi	9	2	Compliant
	Kingsbury Episcopi - Confluence with Isle	9	2	Compliant
	Confluence with Isle - Confluence with Yeo	9	2	Compliant
	Confluence with Yeo - Sowy	10	3	Compliant
	Confluence with Sowy - Oath Lock (Estuary)	11	3	Compliant
Fiddington Brook	Source - Upstream Nether Stowey Sewage Treatment Works	12	2	Compliant
	Upstream Nether Stowey Sewage Treatment Works - Hornhill	12	2	Compliant
	Hornhill - Confluence with Tidal Parrett	13	4	Compliant
Back Brook	Downstream Dimmer Waste Disposal - Confluence with Cary	14	3	Marginal fail (BOD, UNH3)

River name	Stretch Name	Stretch No.	Long Term River Quality Objective	Compliance 1997 - 1999
Cannington Brook	Lower Aisholt - Upstream Hawkridge Reservoir	15	2	Marginal fail (BOD)
	Upstream Hawkridge Reservoir - Downstream Hawkridge Reservoir	16	2	Compliant
	Downstream Hawkridge Reservoir - Ashford Reservoir	17	2	Compliant
	Ashford Reservoir - Blackmore Farm	18	2	Compliant
	Blackmore Farm - Bradley Green	19	2	Compliant
	Bradley Green - Cannington	20	2	Compliant
	Cannington - Confluence with Tidal Parrett	21	2	Compliant
King's Sedgemoor Drain	Henley - Confluence with 18 Feet Rhine	22	3	Marginal fail (DO)
	Confluence with 18 Feet Rhine - Confluence with Sowy	23	3	Significant fail (DO)
	Confluence with Sowy - Parchey	24	3	Significant fail (DO)
	Parchey - Bawdrip	24	3	Significant fail (DO)
	Bawdrip - Dunball 1	25	3	Significant fail (DO, BOD)
	Dunball 1 - Confluence with Tidal Parrett	26	3	Significant fail (DO)
Cary	Source - Cockhill	27	4	Compliant
	Cockhill - Lovington	27	4	Compliant
	Lovington - Babcary	28	3	Compliant
	Babcary - Higher Farm	28	3	Compliant
	Higher Farm - Charlton Mackrell	29	3	Compliant
	Charlton Mackrell - Somerton Randle	29	3	Compliant
	Somerton Randle - Somerton Sewage Treatment Works	30	3	Compliant
	Somerton STW - Henley	30	3	Compliant
Sowy	King's Sedgemoor Drain - Parrett	31	4	Compliant
Durleigh Brook	Pightley - Upstream Durleigh Reservoir	32	2	Compliant
	Upstream Durleigh Reservoir - Downstream Durleigh Reservoir	33	3	Compliant
	Downstream Durleigh Reservoir - Confluence with Tidal Parrett	33	3	Compliant
Petherton Stream	Source - Stream Farm	34	1	Significant fail (BOD)

River name	Stretch Name	Stretch No.	Long Term River Quality Objective	Compliance 1997 - 1999
	Stream Farm - North Petherton	34	1	Significant fail (BOD)
	North Petherton - Confluence with Tidal Parrett	35	3	Compliant
Cobbs Cross Stream	Below Millwood Farm - Goathurst downstream Knoll Farm	36	2	Compliant
	Goathurst downstream Knoll Farm - Confluence with Parrett	37	2	Compliant
Yeo	Charlton Horethorne SewageTreatment Works - Milborne Wick	38	4	Compliant
	Milborne Wick - Milborne Port	39	2	Compliant
	Milborne Port - Upstream Sherborne Lake	40	2	Marginal fail (BOD)
	Upstream Sherborne Lake - Downstream Sherborne Lake	41	2	Marginal fail (BOD)
	Downstream Sherborne Lake - Sherborne Sewage Treatment Works	41	2	Marginal fail (BOD)
	Sherborne Sewage Treatment Works - Thornford	42	2	Compliant
	Thornford - Confluence with Wriggle	42	2	Compliant
	Confluence with Wriggle - Confluence with Sutton Bingham Stream	43	2	Marginal fail (BOD)
	Confluence with Sutton Bingham Stream - Newton Surmaville	44	2	Compliant
	Newton Surmaville - Yeovil Sewage Treatment Works	44	2	Compliant
	Yeovil Sewage Treatment Works - Confluence with Corton Denham Stream	45	3	Compliant
	Confluence with Corton Denham Stream - Confluence with Hornsey Brook	46	3	Compliant
	Confluence with Hornsey Brook - Confluence with Cam	46	3	Compliant
	Confluence with Cam - Yeovilton	46	3	Compliant
	Yeovilton - Northover	46	3	Compliant
	Northover - Little Load	47	3	Compliant
	Little Load - Confluence with Parrett	48	3	Compliant
Cam	North Cadbury Sewage Treatment Works - Confluence with Blackford Stream	49	2	Marginal fail (BOD)

River name	Stretch Name	Stretch No.	Long Term River Quality Objective	Compliance 1997 - 1999
	Confluence with Blackford Tributary - Upstream Sparkford Sewage Treatment Works	49	2	Marginal fail (BOD)
	Upstream Sparkford Sewage Treatment Works - Queen Camel	49	2	Marginal fail (BOD)
	Queen Camel - Confluence with Yeo	50	2	Compliant
Cam Tributary	Source - Confluence with Cam	51	2	Compliant
Hornsey Brook	Source - Little Marston	52	3	Marginal fail (DO, UNH3)
	Little Marston - Confluence with Yeo	52	3	Marginal fail (DO, UNH3)
Corton Denham Stream	Rimpton - Confluence with Yeo	53	3	Marginal fail (DO)
Wriggle	Confluence with Beer Hackett Stream - Thornford Sewage Treatment Works	54	2	Marginal fail (BOD)
	Thornford Sewage Treatment Works - Confluence with Yeo	54	2	Marginal fail (BOD)
Sutton Bingham Stream	Halstockleigh Stream - Corscombe Court	55	2	Compliant
	Corscombe Court - Confluence with Adams Green Tributary	56	2	Compliant
	Confluence with Adams Green Tributary - Confluence with Corscombe Court Tributary	57	2	Compliant
	Adams Green/Corscombe Court Tributary Confluence - Upstream Sutton Bingham Reservoir	57	2	Compliant
	Higher Halstock - Upstream Sutton Bingham Reservoir	58	2	Compliant
	Upstream Sutton Bingham Reservoir - Downstream Sutton Bingham Reservoir	58	2	Compliant
	Downstream Sutton Bingham Reservoir - Downstream Sutton Bingham Water Treatment Works	59	2	Compliant
	Downstream Sutton Bingham Water Treatment Works - Sutton Bingham Supply	60	2	Compliant
	Sutton Bingham Supply - Confluence with Closworth Stream	60	2	Compliant
	Confluence with Closworth Stream - Confluence with Yeo	60	2	Compliant

River name	Stretch Name	Stretch No.	Long Term River Quality Objective	Compliance 1997 - 1999
Closworth Stream	Princes Place - Confluence with Sutton Bingham Stream	61	2	Compliant
Isle	Upstream Chard Reservoir - Downstream Chard Reservoir	62	3	Compliant
	Downstream Chard Reservoir - Chard Sewage Treatment Works	62	3	Compliant
	Chard Sewage Treatment Works - Dunpole Farm	63	3	Marginal fail (BOD)
	Dunpole Farm - Donyatt		3	Compliant
	Donyatt - Upstream Ilminster Bifurcation	64	3	Compliant
	Upstream Ilminster Bifurcation - Confluence with Ding	65	3	Compliant
	Confluence with Ding - Downstream Ilminster Bifurcation	65	3	Compliant
	Upstream Ilminster Bifurcation - Downstream Ilminster Bifurcation	66	2	Compliant
	Downstream Ilminster Bifurcation - Fivehead Sewage Treatment Works	67	3	Compliant
	Fivehead Sewage Treatment Works - Confluence with Fivehead	68	2	Marginal fail (DO)
	Confluence with Fivehead - Confluence with Parrett	68	2	Marginal fail (DO)
Isle Tributary	Pudleigh Mill Farm - Combe St Nicholas Sewage Treatment Works	69	1	Significant fail (DO)
	Combe St Nicholas Sewage Treatment Works - Confluence with Isle	70	3	Compliant
Fivehead	Blackwater - Confluence with Hatch Green Tributary	71	2	Marginal fail (DO)
	Hatch Green - Hatch Beauchamp	72	2	Compliant
	Hatch Beauchamp - Confluence with Blackwater Tributary	73	2	Compliant
	Hatch Green/Blackwater Tributary Confluence - Confluence with Isle	74	2	Marginal fail (DO)
Ding	Ilton - Confluence with Isle	75	3	Compliant
Lam Brook	Shepton Beauchamp - West Lambrook	76	3	Compliant
	West Lambrook - Confluence with South Petherton Stream	76	3	Compliant

River name	Stretch Name	Stretch No.	Long Term River Quality Objective	Compliance 1997 - 1999
	Confluence with South Petherton Stream - Confluence with Parrett	77	3	Compliant
South Petherton Stream	Source - South Petherton	78	4	Compliant
	South Petherton - Confluence with Lamb Brook	78	4	Compliant
Wellhams Brook	Montacute - Confluence with Hinton Meads Brook	79	3	Compliant
	Confluence with Hinton Meads Brook - Confluence with Parrett	79	3	Compliant
Hinton Meads Brook	Fosseway - Hurst	80	3	Significant fail (DO)
	Hurst - Confluence with Wellhams Brook	81	3	Significant fail (BOD, DO)
Lopen Brook	Easterdown Hill - Lopen	82	3	Compliant
	Lopen - Confluence with Parrett	82	3	Compliant
Parrett Tributary	Parrett Tributary Bagnell Farm - Confluence with Parrett	83	2	Compliant
Chinnock Brook	East Chinnock - Middle Chinnock	84	3	Compliant
	Middle Chinnock - Confluence with Parrett	84	3	Compliant
Merriot Stream	Upstream Hinton Park Farm - Confluence with Merriot Stream Tributary	85	2	Compliant
	Confluence with Merriot Stream Tributary - Confluence with Parrett	85	2	Compliant
Merriot Stream Tributary	Maincombe - Marks Barn	86	2	Compliant
	Marks Barn - Confluence with Merriot Stream	86	2	Compliant
Crewkerne Brook	Henley - Crewkerne	87	2	Compliant
	Crewkerne - Confluence with Parrett	88	3	Significant fail (BOD)

5.2. General Quality Assessment

We also use the General Quality Assessment scheme (GQA) to report at a general level on river quality and to show trends. The scheme has 6 classes (see Figure 10) and is used to report on chemical quality (A-F) and biological quality (a-f).

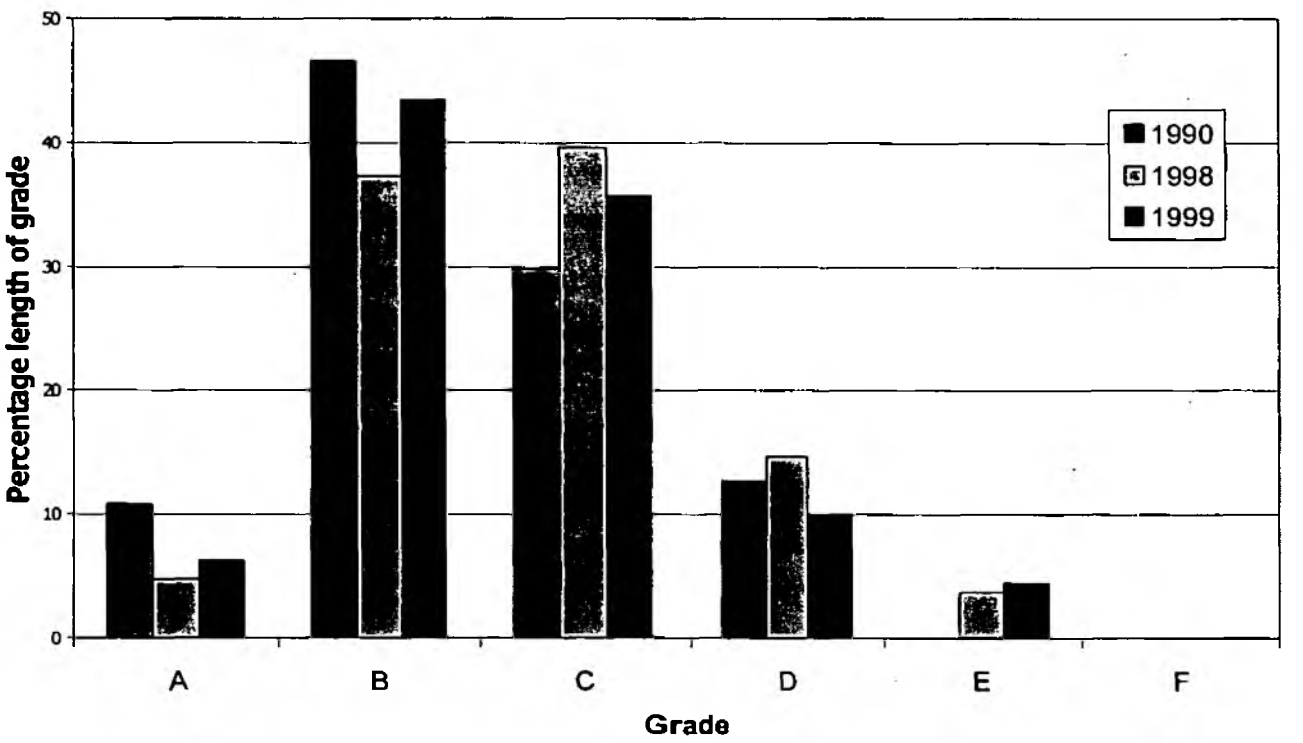
Chemical water quality is measured annually while biological quality is measured every five years. The biological survey has been carried out during 2000 and 2001.

Figure 10: General Quality Assessment (GQA) Classification

Water Quality Description	Chemical Class	Biological Class
Very Good	A	a
Good	B	b
Fairly Good	C	c
Fair	C	d
Poor	E	e
Bad	F	f

In the North Wessex Area as a whole there has been a gradual improvement in chemical water quality over the last 10 years. Percentage lengths of grades A and B have risen and grade C decreased. Grades D to F have also decreased slightly. In 1990 there was 388.5 km of watercourse graded A or B in the North Wessex Area; the total length for these 2 grades had increased to 1009 km by 1999. The trends for the Parrett catchment over the same period are shown in Figure 11.

Figure 11: % length of watercourse by chemical GQA grade 1990, 1998 and 1999.



The water quality of the Parrett catchment appears to have deteriorated slightly since 1990. In 1990 57% of watercourse was good or very good quality, whereas in 1999 it was down to 50%. In 1990 there was no grade E stretches, whereas in 1999 they comprised 4.5%. With the exception of a slight increase in grade E stretches, water quality appears to have improved over the shorter timescale between 1998 and 1999. Since 1998 when only 42% of watercourse was good or very good quality, grades A and B have increased and grade D and E have decreased.

A considerable number of watercourse stretches in North Wessex have improved in quality for the period 1998-1999, resulting in a substantial upgrade. This improvement is largely due to upgrading of water treatment works and pollution prevention campaigns to improve farming practices, which are taking now effect. The upgraded stretches for the Parrett catchment are given in section 2.2: Key Achievements. Only 4 stretches in the North Wessex area have been downgraded, and none of these are in the Parrett catchment.

6. Duties, powers and interests of the Agency

6.1. Water Resources: The Agency has a duty to conserve, redistribute, augment and secure the proper use of water resources.

The Agency has powers to:

- grant or vary water abstraction and impoundment licences on application, with appropriate conditions imposed to safeguard the needs of the environment whilst allowing reasonable and justified use of available and sustainable water resources, with the aim of achieving an equitable balance between competing demands
- revoke or vary existing licences to reinstate flows or levels to surface or groundwaters that have become depleted as a result of abstraction; compensation may be payable if such powers are used
- secure the proper use of water resources through its role in water resources planning and the assessment of reasonable need for abstractions, and the promotion of more efficient use of water resources
- monitor and enforce abstraction and impoundment licence conditions
- issue conservation notices to direct appropriate practices with regard to water resources issues associated with exempt de-watering activities

The Agency has an interest (but no powers) in:

- the more efficient use of water by water companies, developers, industry, agriculture and the public, and the introduction of water efficiency measures and suitable design and layout of the infrastructure
- protecting the water environment from any adverse impact due to proposed major developments

Partnership:

- the Agency is committed to water demand management and will work closely with water companies and developers, local authorities, other relevant organisations and the public 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 resources development, alongside the promotion of demand management measures
- the Agency uses its position as a statutory consultee to the planning authorities to secure conditions and agreements that protect the water environment and that encourage water conservation measures; the Agency also seeks to influence planning decisions for new development by ensuring that planning authorities allow for any lead-time required for resource development

6.2. Flood Defence: The Agency has a duty to exercise general supervision over all matters relating to flood defence throughout each catchment.

The Agency has powers to:

- control, through Land Drainage consents, development within 8m of main river (*Water Resources Act 1991, Section 109*) or construction of a structure that would affect the flow of an ordinary watercourse (*Land Drainage Act 1991, Section 23*)
- produce flood risk maps for all main rivers under Section 105 of the Water Resources Act 1991
- undertake works to main rivers using permissive powers
- issue flood warnings to the public relating to main rivers, local authorities and the police
- consent mineral workings within 16m of main rivers

The Agency has an interest (but no powers) in:

- granting of planning permission throughout a catchment but especially floodplains where development can significantly increase flood risk; this permission is granted by local planning authorities
- installation of surface water source control measures
- supervising the maintenance of ordinary watercourses which is a local authority remit, but may impact on main rivers
- installation of buffer zones which reduce flood risks and have significant environmental benefits
- urban and rural land use and measures that can reduce flood risk or the need for watercourse maintenance

Partnership:

- as a statutory consultee on planning applications within main river floodplains the Agency offers advice based on knowledge of flood risk; we also advise on the environmental impacts of floodplain development
- the Agency will encourage best practice, including source control measures and common standards, among local authorities and riparian owners to protect and enhance the environment
- the Agency works with civil authorities to prepare flood warning dissemination plans and supports their endeavours to protect communities at risk

6.3. Waste Management: The Agency has a duty to regulate the management of waste, including the treatment, storage, transport and disposal of controlled waste, to prevent pollution of the environment, harm to public health or detriment to local amenities.

The Agency has powers to:

- vary waste management licence conditions
- suspend and revoke licences
- investigate and prosecute illegal waste management operations

The Agency has an interest (but no powers) in:

- 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

Partnership:

- 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

6.4. Water Quality: The Agency has a duty to monitor, protect, manage and where possible enhance the quality of controlled waters including rivers, groundwaters, lakes, canals, estuaries and coastal waters through the prevention and control of pollution.

The Agency has powers to:

- issue discharge consents to controlled pollution loads in controlled waters
- regulate discharges to controlled waters in respect of water quality through the issue and enforcement of discharge consents
- issue works, enforcement and groundwater notices where action is required to reduce the risk of pollution
- prosecute polluters and recover the costs of clean-up operations
- serve prohibition notices (with or without conditions) on highway authorities to require treatment and pollution measures for highway runoff
- regulate new and modified structures on farms to reduce the risk of pollution

The Agency has an interest (but no powers) in:

- the greater use of source control measures to reduce pollution by surface water runoff
- prevention and education campaigns to reduce pollution incidents
- the provision of highway runoff control measures which is a highway authority remit

Partnership:

- 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 authorities on the water quality impact of proposed developments

6.5. Air Quality: The Agency has a duty to implement Part 1 of the *Environmental Protection Act 1990*.

The Agency has powers to:

- regulate the largest technically complex and potentially most polluting processes such as refineries, chemical works and power stations including enforcement of, and guidance on, Best Available Technology Not Entailing Excessive Cost (BATNEEC) and Best Practicable Environmental Option (BPEO)
- have regard to the Government's National Air Quality Strategy when setting standards for the releases to air from industrial processes

The Agency has an interest (but no powers) in:

- the vast number of smaller industrial processes which are controlled by local authorities
- control over vehicular emissions and transport planning

Partnership:

- the Agency provides data on Integrated Pollution Prevention and Control processes and advice on planning applications to local authorities
- the Agency is willing to offer its technical experience to local authorities on the control of air pollution
- the Agency wishes to liaise with local authorities in the production of Air Quality Management Plans
- the Agency will advise and contribute to the Government's National Air Quality Strategy

6.6. Radioactive Substances: The Agency has a duty under the *Radioactive Substances Act 1993* to regulate the use of radioactive materials and the disposal of radioactive waste.

The Agency has powers to:

- issue certificates to users of radioactive materials and disposers of radioactive waste, with an overall objective of protecting members of the public

The Agency has an interest (but no powers) in:

- the health effects of radiation

Partnership:

- the Agency will work with users of the radioactive materials to ensure that radioactive wastes are not unnecessarily created, and that they are safely and appropriately disposed of; the Agency will work with the Ministry of Agriculture, Fisheries and Food to ensure that the disposal of radioactive waste creates no unacceptable effects on the food chain
- the Agency will work with the Nuclear Installations Inspectorate to ensure adequate protection of workers and the public at nuclear sites
- the Agency will work with the Health and Safety Executive on worker protection issues at non-nuclear sites

6.7. Contaminated Land: 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 the environment.

The Agency has powers to:

- regulate the remediation of contaminated land designated as special sites
- prevent future land contamination by means of Integrated Pollution Prevention and Control, water quality and other statutory powers
- report on the state of contaminated land

The Agency has an interest (but no powers) in:

- securing with others, including local authorities, landowners and developers, the safe remediation of contaminated land

Partnership:

- the Agency supports land remediation and will promote this with developers and local authorities and other stakeholders

6.8. Conservation: 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.

The Agency will:

- further conservation wherever possible when carrying out water management functions
- have regard to conservation when carrying out pollution control functions
- promote the conservation of flora and fauna which are dependent on the aquatic environment

The Agency has an interest (but no powers) in:

- the conservation impacts of new development; these are controlled by local planning authorities
- protection of specific sites or species, which is a function of English Nature; the Agency does, however, provide advice to local authorities and developers to protect the integrity of such sites or species
- implementation of the *United Kingdom Biodiversity Action Plan*

Partnership:

- the Agency supports action to sustain or improve natural or 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

6.9. Landscape: The Agency will further landscape conservation and enhancement when carrying out water management functions, have regard to the landscape when carrying out pollution control functions, and promote the conservation and enhancement of the natural beauty of rivers and associated land.

The Agency has powers to:

- 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

The Agency has an interest (but no powers) in:

- the landscape impact of new development, particularly within river corridors; this is controlled by local planning authorities

Partnership:

- 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

6.10. Archaeology: The Agency has a duty to consider the impact of all its regulatory, operational and advisory activities upon archaeology and heritage, and implement mitigation and enhancement measures where appropriate.

The Agency has powers to:

- promote its archaeological objectives through the exercise of its water management and pollution control powers and duties

The Agency has an interest (but no powers) in:

- direct protection or management of sites of archaeological or heritage interest; this is carried out by local planning authorities, county archaeologists and English Heritage

Partnership:

- 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

6.11. Fisheries: The Agency has a duty to maintain, improve and develop salmon, trout, freshwater and eel fisheries.

The Agency has powers to:

- regulate fisheries by a system of licensing
- make and enforce fisheries byelaws to prevent illegal fishing
- promote the free passage of fish and consent fish passes
- monitor fisheries and enforce measures to prevent fish entrainment in abstractions
- promote its fisheries duties by means of land drainage consents, water abstraction applications and discharge applications

The Agency has an interest (but no powers) in:

- the determination of planning applications which could affect fisheries

Partnership:

- many development schemes have significant implications for fisheries; the Agency will work with anglers, riparian owners, developers and local authorities to protect fisheries

6.12. Recreation: The Agency has a duty to promote recreational use of rivers and water space (we have no navigation responsibilities in the South West Region).

The Agency has powers to:

- contribute to its recreation duty through the exercise of its statutory powers and duties in water management

The Agency has an interest (but no powers) in:

- promotion of water sports; this is carried out by the Sports Council and other sports bodies

Partnership:

- the Agency will work with the Countryside Agency, the Sports Council, British Waterways and other relevant organisations to optimise recreational use of the water environment

7. Environment Agency leaflets and publications

Please tick the boxes next to the publications you require. To order, cut out this page, fill in your details overleaf, and return the whole page to:

Customer Contact, Environment Agency, Rivers House, East Quay, Bridgwater, Somerset TA6 4YS

- Abstraction Licensing and Water Resources - a guide for potential abstractors ☐
- Accessing Information - the Environment Agency's Pollution Inventory ☐
- Addressing Climate Change ☐
- Agreeing Access to Water for Canoeing ☐
- Agricultural Pesticides and Water ☐
- An Environmental Vision - the Environment Agency's contribution to sustainable development ☐
- Anglers and the Environment Agency ☐
- Angling and Wildlife - golden rules ☐
- Aquatic Eutrophication (leaflet) ☐
- Aquatic Eutrophication - a management strategy ☐
- Aquatic Weed Control - best practice guidelines ☐
- Are You Doing Your Bit for the Environment? ☐
- Blue-green Algae ☐
- Buyer Beware - handling and purchase of wild salmon and sea trout ☐
- Charging for Information ☐
- Chemical Pollution - how to avoid it ☐
- Classification of Special Waste ☐
- Coarse Fisheries Strategy ☐
- Conservation Designations in England and Wales ☐
- Contaminated Land Remediation ☐
- Customer Charter - a guide to our services and standards ☐
- Disposal of Cut Vegetation - best practice guidelines ☐
- Education Resources for Schools ☐
- Enjoy Your Garden - care for our environment ☐
- Environment Agency and Land Contamination ☐
- Environment Agency and the use of Licences to Prevent Pollution ☐
- Environment of England and Wales - a snapshot ☐
- Environmental Prospectus for South West England ☐
- Farm Waste Minimisation ☐
- Farm Pollution - how to avoid it ☐
- Farm Waste Regulations ☐
- Flood Warning Information - what to do if your property is at risk ☐
- Freshwater Fisheries and Wildlife Conservation - good practice guide ☐
- Garden with Care and Protect the Environment ☐
- General Guide to the Prevention of Water Pollution ☐
- Genetic Modification and Sustainability ☐
- Groundwater Protection Policy ☐
- Groundwater Protection Zones ☐
- Groundwater Regulations ☐
- Guidance for the Control of Invasive Plants near Watercourses ☐
- Guidance Notes for Riparian Owners ☐
- Guide to Good Environmental Practice for Trading Estates and Business Parks ☐
- Habitats Directive - what it means for us and you ☐
- Have Fun, Have a Care - information for river canoeists ☐
- Home Pollution - how to avoid it ☐
- How to Reduce Water Use ☐
- Identifying Freshwater Crayfish in Britain and Ireland ☐
- Identifying Freshwater Invertebrate Life ☐
- Integrated Pollution Control - introductory guide ☐
- Landfill Directive ☐
- Lessons Learned - the autumn 2000 floods ☐

Living on the Edge - a guide for riverside owners ☐
Local Agenda 21 ☐
Make Your Own Compost ☐
Making the Right Connection - avoiding water pollution ☐
Making Your Home and Garden More Water Efficient ☐
Managing Maize - environment protection with profit ☐
Managing Water Abstraction - the Catchment Abstraction Management Plan process ☐
Mink ☐
Mobile Sheep Dipping - a guide to reducing pollution risks ☐
National Eel Management Strategy ☐
Nature's Way - a guide to surface water best management practices ☐
New Packaging Regulations - how do they affect you? ☐
North Wessex Area Industrial and Commercial Waste Minimisation and Recycling Directory ☐
Oil Care Code ☐
Phytophthora Disease of Alder ☐
Policy and Practice for the Protection of Groundwater ☐
Policy and Practice for the Protection of Floodplains ☐
Ponds and Conservation ☐
Pond Heaven- how to create your own wildlife pond ☐
Preventing the Spread of Crayfish Plague in the South West ☐
Producer Responsibility Obligations - guidance ☐
Protection through Partnership - North Wessex ☐
Recovering the Cost of Pollution ☐
Review of Flood Defence Management Practices on the Somerset Levels and Moors ☐
Safe Storage and Disposal of Used Oils ☐
Saving Water - on the right track ☐
Sheep Dipping ☐
Silage Pollution - how to avoid it ☐
Silt Pollution - how to avoid it ☐
Somerset Levels and Moors Water Level Management Action Plan ☐
Somerset Levels and Moors Water Level Management Action Plan Annual Review ☐
Special Waste Regulations - technical assessment of waste ☐
Spray Irrigation - information for potential irrigators ☐
Stocking Fish - a guide for fishery owners and anglers ☐
Sustainable Urban Drainage - a guide ☐
Waste Minimisation - an environmental good practice guide for industry ☐
Water Plants - their function and management ☐
Water Pollution Incidents in England and Wales ☐
Water Resources for the Future - a strategy for South West Region ☐
West Sedgemoor Pumping Station ☐
What a Waste ☐
Will you be affected by the Landfill Directive? ☐
Understanding Buffer Strips ☐
Understanding Riverbank Erosion ☐
Useful Information for Angling Clubs ☐

Name.....

Address.....
.....
.....

Please note: The above list is a selection of Environment Agency publications, subject to availability. If you are interested in an area of our work which is not covered, please phone our Customer Contact Team on **01278 457333**.

Further information is also available on our website: **www.environment-agency.gov.uk**.

CONTACTS:

THE ENVIRONMENT AGENCY HEAD OFFICE

Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol BS32 4UD.
Tel: 01454 624 400 Fax: 01454 624 409

www.environment-agency.gov.uk
www.environment-agency.wales.gov.uk

ENVIRONMENT AGENCY REGIONAL OFFICES

ANGLIAN
Kingfisher House
Goldhay Way
Orton Goldhay
Peterborough PE2 5ZR
Tel: 01733 371 811
Fax: 01733 231 840

MIDLANDS
Sapphire East
550 Streetsbrook Road
Solihull B91 1QT
Tel: 0121 711 2324
Fax: 0121 711 5824

NORTH EAST
Rivers House
21 Park Square South
Leeds LS1 2QG
Tel: 0113 244 0191
Fax: 0113 246 1889

NORTH WEST
Richard Fairclough House
Knutsford Road
Warrington WA4 1HG
Tel: 01925 653 999
Fax: 01925 415 961

SOUTHERN
Guildbourne House
Chatsworth Road
Worthing
West Sussex BN11 1LD
Tel: 01903 832 000
Fax: 01903 821 832

SOUTH WEST
Manley House
Kestrel Way
Exeter EX2 7LQ
Tel: 01392 444 000
Fax: 01392 444 238

THAMES
Kings Meadow House
Kings Meadow Road
Reading RG1 8DQ
Tel: 0118 953 5000
Fax: 0118 950 0388

WALES
Rivers House/Plas-yr-Afon
St Mellons Business Park
St Mellons
Cardiff CF3 0EY
Tel: 029 2077 0088
Fax: 029 2079 8555

ENVIRONMENT AGENCY
GENERAL ENQUIRY LINE
0845 933 3111

ENVIRONMENT AGENCY
FLOODLINE
0845 988 1188

ENVIRONMENT AGENCY
EMERGENCY HOTLINE
0800 80 7060

ENVIRONMENT AGENCY

All enquiries to:
North Wessex Area
Rivers House
East Quay
BRIDGWATER
TA6 4YS

Publication code: PAR SW 10/01- 0.75k-D-BGCA