EA NORTH WEST

North West

CONSERVATION, BIOLOGY AND RECREATION

annual report 1998-99

ENVIRONMENT AGENCY

CONSERVATION, BIOLOGY AND RECREATION REPORT 1998/9

Contents

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INTRODUCTION

This report provides a brief overview of the work and major issues in the Region over the 1998 / 9 financial year. The regional overview that follows this introduction gives an outline of the key work areas of national or regional significance. Later sections provide details of some projects undertaken to benefit the wildlife and people of the North West.

For operational purposes, the North West Agency is structured along functional lines to deliver the aims and duties which underpin our environmental responsibilities. The conservation function is incorporated with biology into ecology, with fisheries and recreation being separate. The Fisheries, Ecology and Recreation , (FER) teams deliver this service locally on the ground. The FER function works closely with other Agency functions such as Water Resources, Flood Defence and Environmental Protection to ensure that conservation and sustainability duties are furthered and this collaboration provides many benefits. For example, ecologists will advise flood defence engineers on the possible impact of flood defence engineering works and ways to incorporate features that will enhance wildlife and promote recreation. The same is true of water resources work. Because conservation and recreation work in the North West region is funded mainly by recharge to other Agency functions, there is little capital money for improvements.
It is therefore very important that features that will enhance conservation and / or recreation are incorporated into other Agency project plans at an early stage in the planning of such projects. Such co-operation is possible because the duty to promote conservation and recreation goes across all functions.

This year's report includes for the first time biological work done by ecologists, as this represents a significant proportion of the workload in ecology. Most of the work done is for the Environmental Protection function in helping to assess water quality and pollution problems. A full account of the generic types of work is given in the first section of this report.

We hope that you find the report interesting and informative.

The Agency also produces a Fisheries Annual report that highlights some of the work done by fisheries staff to maintain, improve and develop fisheries in the North West region. Copies may be obtained from the address below.

The Agency would welcome any comments and suggestions that could be used to further improve the report.

Please address any queries or suggestions for improvement to:

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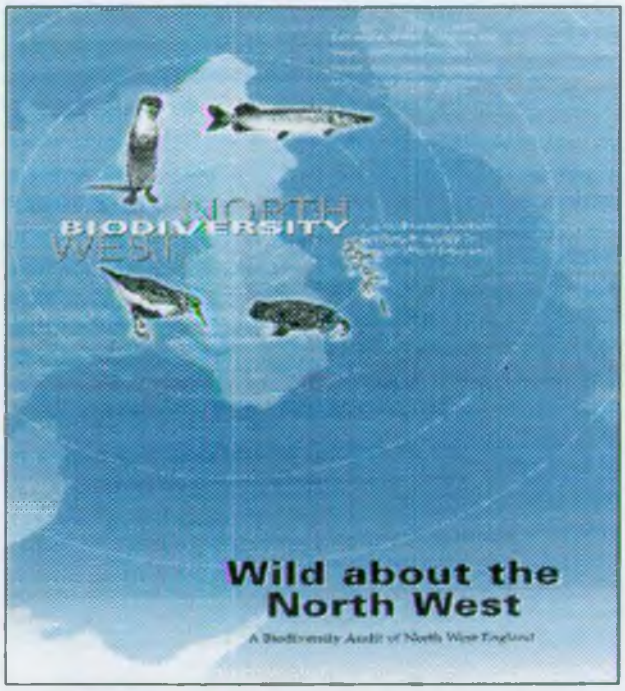
REGIONAL OVERVIEW

Biodiversity

Delivering the Agency's actions for biodiversity and implementing our duties under the Habitats Directive continue to be the guiding beacons for the Conservation Function.

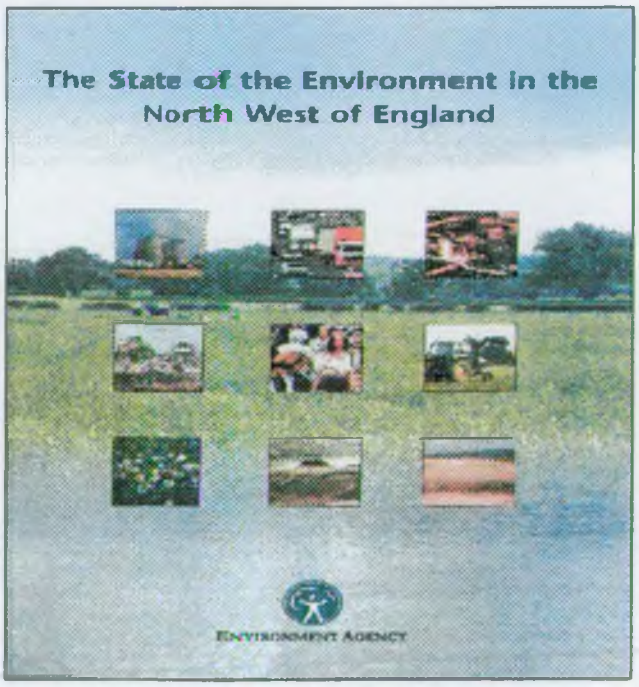
The North West region has a great wealth of wildlife. However, there remain many pressures on this resource and many species and habitats continue to decline. The UK Biodiversity Action Plan (BAP) aims to halt and reverse the declines experienced by a wide range of the most threatened species and habitats. In the North West the Agency has duties for a wide range of actions for species and habitats from rare ferns to lakes. The year 1998/1999 was a significant one for the UK BAP as draft plans were produced for many new species and habitats (although some are due for publication in 1999/2000). The Agency played a full part in the formulation of those plans for which actions are required from it. When published the Agency will be signed-up to action in over 160 national action plans for species and habitats. Almost 60 of these species and habitats occur in this region. The region continues to focus its efforts upon those species for which the Agency has a special contact point or lead agency role. These include rare fish such as vendace, twaite and allis shad, freshwater crayfish, otter, and freshwater pearl mussel. Action is also focused upon key wetland habitats such as fens, reedbeds, wet grassland and mesotrophic lakes. Taking a habitat based approach can provide the conditions for a range of species as well as the key ones. A range of key biodiversity actions is included in the report. These include action for freshwater pearl mussel, freshwater crayfish and water vole. Actions for otters have been co-ordinated on a regional scale, with a regional steering group agreeing a region wide action plan. The Agency has continued its work for the otter through specific habitat improvement works and survey work at key strategic locations.

At a regional level the Agency is a member of the Regional Biodiversity Forum. The Agency provided technical and financial resources towards the publication of 'A biodiversity audit of North West England'. This report was the result of over two years of work by the group, culminating in a launch in January 1999. The Agency will utilise the audit in planning its work for biodiversity and it is hoped that the audit will likewise prove useful to many other organisations.



A Biodiversity Audit of North West England

The Agency has sustainable development at the heart of its remit and recognises biodiversity as a key test of sustainability. 'The State of the Environment in the North West of England' was published in 1998 by the Agency. This report aims to present a baseline of information for measuring future progress and to outline the key issues facing the region in the future.



State of the Environment report

Biodiversity is therefore a key part of the report.

Current pressures upon biodiversity, the present state of the region's biodiversity and an insight into what should be our response to this in the future, are all outlined in the report.

At a more local level there was considerable progress with the BAPs being produced for the 'County' areas (Cumbria, North Yorkshire, Lancashire, Manchester, Merseyside and Cheshire). The Agency continued to play a key part in their development with action focussed upon delivering national and regional priority actions within a local context.

Habitats Directive

The Habitats Directive makes it a requirement for the Agency to review existing consents, licences, authorisations etc., that have a potentially significant effect upon internationally designated conservation sites (i.e. Special Areas of Conservation (SAC's) and Special Protection Areas (SPA's)). Such sites must not only be protected but be kept at a favourable ecological status. 'Guidance for the review of Agency Permissions' was published in 1999. With the many tens of thousands of licences etc., that the Agency permits within, or close to, these sites this is a major task. For example, the hundreds of water quality discharge consents for a river SAC would require reviewing to determine whether they create favourable conditions for species such as salmon, lamprey and pearl mussel. Work on the review has slowed down due to unexpected delays in the sites becoming fully designated. There will be a staged process that sites will undergo according to their priority for action. Progress will follow a regional timetable terminating in 2004.

Despite slow down on the Habitats Directive review, new applications for permissions continue to come forward within or adjacent to SACs and SPAs. Examples in this report period include: (i) water abstraction licences at Oak Mere SAC, Cheshire; River Eden (Eamont) SAC Penrith, Cumbria; and Sefton Coast SAC, Merseyside; (ii) discharge consents to Morecambe Bay SAC/SPA, Lancashire; (iii) process industry regulation authorisations adjacent to the Mersey Estuary SPA. Such applications require the closest ecological scrutiny and assessment.

Water Resources: Wetlands and Rivers

Further strategic water 'quantity' work continued into 1998/99. The review of wetland Special Site of Scientific Interest (SSSI) vulnerability to water abstraction was completed in the region. This will be published, as part of a national document, later in 1999. Production of Water Level Management Plans (WLMPs) continued with the publication of the Roundsea Wood and Mosses WLMP for the Cumbrian site.

Conservation Liaison

Influencing others through effective communication is a key element of the work of Ecology in the region. Externally, Ecology staff continued to play a key role on a wide variety of Fora, groups and committees from River Valley Initiatives to Ministry of Agriculture, Fisheries and Food (MAFF) liaison groups. All three Areas held Annual Conservation Liaison Meetings (ACLM's) in which key local organisations from the field of conservation meet to discuss Agency plans and proposals for the coming year. The focus of the ACLM continued to broaden from the traditional examination of the flood defence programmes to include broader issues such as sustainable land management and water resources. Ecology staff continued to raise awareness of the Agency's conservation duties with internal colleagues through presentations and conservation awareness events.

Changing Work Patterns

Changes in legislation, policy and procedure are frequent and priorities are constantly changing in the Conservation work area. It is therefore vital that there is both a clear understanding of work priorities and a constant look at where existing practice could be improved. During the year the majority of the conservation site constraints (from international, national and local sites) were added to a regional Geographical Information System (GIS). It is hoped that a GIS system will prove to be a more efficient method of holding and utilising this data to screen the thousands of consents and operations that Ecology examines each year.

River Habitat Restoration

- **Sustainable River Management Project**

The Sustainable River Management Project had a very successful first year, and is continuing the success into a second year.

The aim of the project is to provide a mechanism for influencing farming practices on a catchment scale. The Agency is using the Farming and Wildlife Advisory Group (FWAG) as an effective link into the farming community. FWAG visit farms in the target catchments and produce a farm wide report called Landwise. This report highlights farming practices that may be affecting the river and suggests better alternatives. FWAG also assist with grant applications and explores alternative funding to ensure there is uptake of best practice advice. To drive the message home promotional events such as workshops and farm walks have been organised. More than 50 farmers have attended these events and they have proved an excellent way of getting the message across (see photo – farmers at farm walk.)

In the first year, the catchments targeted were, the Ehen in Cumbria, the Weaver in Cheshire and the Ribble in Lancashire. The success of the project was impressive and over £1million was invested throughout the region for on the ground improvements.

In 1999 the Weaver in Cheshire is still being targeted. Collaboration with Cheshire County Council has ensured all the farms owned by the County Council, on the catchment, will also be audited and encouraged to farm in an environmentally sensitive manner.

Farmers at farm walk

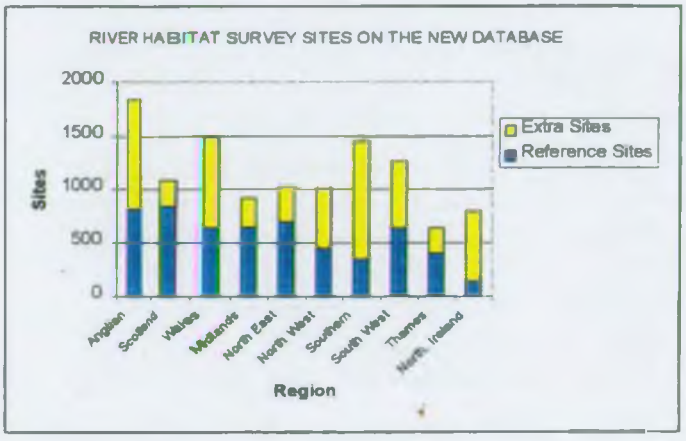
In Lancashire, habitat restoration works on the rivers Ribble and Hodder have been progressed. In particular, improvement work has been completed at two sites on Smithies Brook in collaboration with the local landowner. Restoration advice has been provided to the landowner on Wigglesworth Beck after this beck was illegally staightened. A tree planting scheme was completed on the Hodder at Burholme farm and the Agency monitored the progress of other habitat projects completed in 1997.

In Cumbria the Sustainable River Management project is targeting the Ellen, whilst still maintaining contact with farmers on the Ehen. The response from the farmers on the Ellen has been excellent with many attending the launch and requesting visits from FWAG.

River Habitat Survey (RHS)

The North West Region is responsible for managing the implementation of River Habitat Survey throughout England and Wales.

The RHS team has been extremely busy working on the input, and checking the quality, of all the additional data that has been collected since 1994. More than 6000 survey forms and the associated map data have been entered onto the RHS database (*see figure below*). Also, all RHS sites collected since 1994 are being transferred from 1:50000 to 1:25000



scale OS Pathfinder maps. This is to ensure that slope and grid references are assessed as accurately as possible.

- **RHS and Europe: Vienna Conference and CEN Workshop**

An international conference on 'Assessing the Ecological Integrity of Running Waters' was held in Vienna in November 98. The main theme of the conference was centred around the work of the European Commission on river basin management policies (the 'Water Framework Directive'). The overall aim was to present, and discuss, existing methodologies and their potential use towards integrated river basin management.

Biological and non-biological methodologies were presented, including RHS. One oral presentation summarising the survey methodology was given, whilst 3 posters illustrated the potential uses of the RHS. A short demonstration of the database was also performed. RHS raised significant interest from some

European and overseas colleagues and copies of the RHS manual, database and RHQ report have been widely distributed from the United States to Russia.

The conference was followed by a CEN workshop (European Committee for Standardisation). The aim was to establish common methods of assessing the hydromorphological status of rivers in Europe as required by the Water Framework Directive (WFD). As well as RHS, 3 other habitat assessment systems were presented (French, German and Austrian methods). The four systems presented similarities in terms of the features and processes assessed, but differences in their approach to measuring quality. Future discussions will focus on designing habitat quality assessment schemes that enable meaningful comparisons between the systems.

Further information can be obtained by contacting the National RHS Co-ordinator, based at RFH Warrington. A regular newsletter is produced which details plans and projects.

Biology

Biological investigation is an essential element in the Agency's integrated approach to environmental monitoring and is carried out to establish existing conditions, identify trends and target resources to bring about improvements.

Biological investigations can be divided into two types:

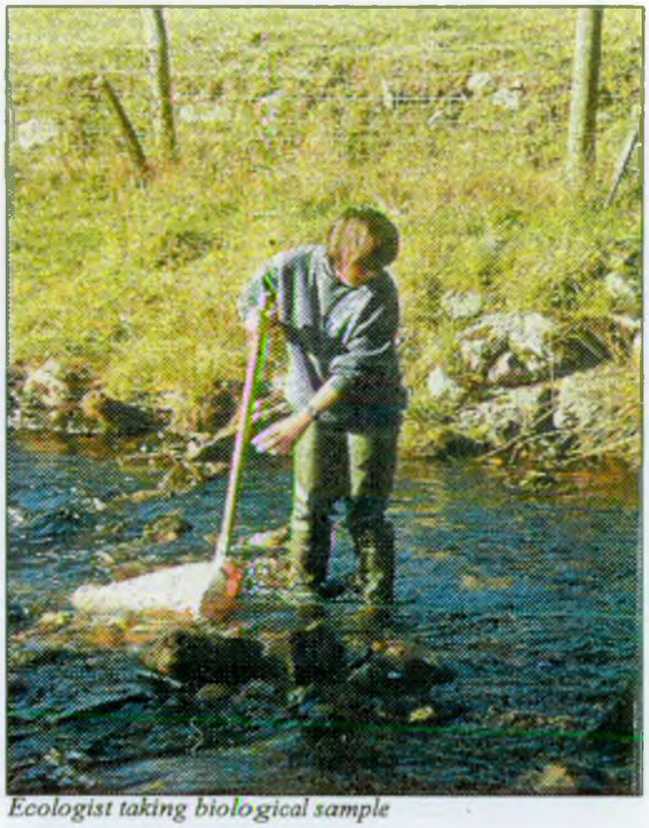
Routine programmes, designed to meet statutory requirements, national programmes and essential regional background monitoring to meet the Agency's general duties and operational needs.

Special Investigations are specific, fixed term studies to address issues or assess environmental impacts.

- **Routine Programme**

The bulk of the biological work programme consists of routine monitoring at a network of sites, using macroinvertebrates as indicators of water quality. A great deal of information can be gained by comparing animals found in the sample with those expected if the river was not impacted. The information can be used to:

- classify rivers into one of 6 grades (a – very good, to f – bad),
- detect past or ongoing pollution incidents,



Ecologist taking biological sample

- determine the type of pollutant (e.g. organic farm waste, toxic sheep dip, acidification),
- provide a picture of quality integrated over time.

A number of other monitoring methods are also used, including macrophytes and diatoms to monitor nutrient status, plankton studies in still waters, and marine biological surveys to monitor the state of the coast.

Macroinvertebrates are used to assess Water Quality

European Union Directives

European Union (EU) Directives place requirements upon the UK for biological data which is supplied by the Agency. The Urban Wastewater Treatment Directive (UWWTD) requires biological monitoring to support the identification of waters that are, or could become, eutrophic. The North West region has 23 sensitive areas, and uses the results from surveys of macrophytes and diatoms to drive investment in improvements at waste water treatment works.

National Policy

The Agency has national requirements for monitoring and reporting and also supplies biological data to Department of Environment Transport and Regions (DETR) national monitoring programmes.

The National Marine Monitoring Programme aims to assess long term changes in coastal environmental quality. Many partners are involved in the scheme (e.g. Ministry of Agriculture Fisheries and Food (MAFF), Scottish Environment Protection Agency (SEPA), Centre for Environment, Fisheries and Aquaculture Science (CEFAS). The Agency is responsible for collecting and analysing fish and invertebrate samples from Morecambe Bay, St Bees Head, Outer Ribble estuary, Mersey estuary and Liverpool Bay. (See photo)

Ecologist taking marine biological sample

The General Quality Assessment (GQA) scheme aims to assess the overall quality of rivers in accordance with the national survey programme. The biological scheme is based on sampling macroinvertebrates which, for GQA purposes, are collected and taken back to the laboratory for detailed identification. Using this information, all rivers in the North West are classified biologically from a (good) to f (bad). The full network of GQA sites (963 in the North West) are sampled and reported every five years although a significant number are sampled annually for local requirements such as Local Environment Agency Plans (LEAP'S).
The next full GQA assessment will take place in 2000.

- **Local Operational Requirements.**

Biological information is needed for a number of requirements at a local level For example to:

- detect the impact of local issues such as industry, urban runoff and agriculture,
- identify where expenditure on improvements is required and can be most beneficial e.g. North West Water Ltd. Asset Management Plan (AMP) programme,
- monitor the success of improvement schemes.

Biological techniques are also used locally to provide information for the assessment of pollution incidents and to provide evidence to support prosecutions. Biological evidence is important for identifying or confirming the source and cause of a pollution incident and can also assist in determining the extent of its effect. Magistrates are likely to regard an incident more seriously if evidence of ecological damage can be provided.

- **Special Investigations.**

These are biological investigations which do not form part of the routine monitoring programme. They may arise from a number of issues raised at a local level such as mine water discharges, sheep dip disposal, blue green algae blooms, diffuse pollution, and pollution tracing. Examples of special investigations carried out throughout the region are given in the Area sections following.

Recreation Overview

The Agency has various legal duties towards recreation, from which it has derived its aim for recreation, which is "to protect, improve and promote recreation on or near water." This relates to all recreation associated with water, including formal water sports, such as sailing, fishing and canoeing and informal activities, such as walking, cycling, picnicking and bird watching.

The post of Regional Recreation Officer has been created within the Agency in this region in order to help raise the profile of recreation. This post will give

the region a strategic overview of the North West allowing actions to be targeted to make more effective use of the recreation resource.

The targeting of actions is also assisted through the LEAP process and many of the LEAPs of the region include issues associated with recreation and access. These LEAP issues allow us to raise local problems and seek their resolution often through partnerships with other bodies. We recognise a need to improve the recreation input into LEAPs.

The Agency in North West region has few significant land holdings and so the scope for recreation on Agency owned sites is limited. One exception to this is Sale Water Park in south Manchester, where Trafford Metropolitan Borough Council manages the site, for recreation, and here there are significant recreational opportunities, including a full range of water sports as well as informal recreation, such as walking, bird watching and fishing.

As you will see from many of the projects in this report, they come about from opportunities to work with others on land they own. In these cases we seek to protect and improve recreation and access, whilst taking into consideration its impacts on the environment and other users. We can offer advice, expertise and examples of best practice. By working with others we can maximise the effect of the resource we have available and develop synergies by working in close partnership.

Promoting recreation is another aim of the Agency and the "Messing about on the Mersey" project is a good example of how we can achieve this. In this instance we have identified a need for a user guide to the Mersey giving information on available recreational facilities and have funded the study into what exactly is required. Now we will be looking to others to put together the information the public is asking for. We also provide information on recreation through leaflet production, both locally and nationally, and the provision of interpretative material.

◆ Messing About on the Mersey

There is huge potential for leisure and recreation in and around the Mersey Estuary which the large local population can benefit from, but, there is a general lack of awareness of the opportunities available. This issue is recognised by the Agency and the wider Mersey Strategy partnership.

In view of this, the Agency decided to initiate the development of a high profile leisure and recreation guide to the Mersey Estuary with a cash contribution of £25,000. The guide is being developed through the Mersey Strategy, in particular the Recreation Implementation Group. The Mersey Strategy are providing project management role, practical advice, inputting into the content of the document, and assisting the Agency in securing additional funding.

The Agency was delighted to fund Phase 1 of the project - the market research. This was deemed an essential step in the project development as local people, potential users and visitors to the Estuary needed to be consulted to ensure the information presented in the final product meets the demand of current and future recreational users of the Mersey Estuary.

The North West Tourist Board were commissioned to undertake the market research work, which was completed in March this year. The main objectives of this work were to ascertain:

- whether there is the demand for a recreation guide to the Estuary;
- if so, what format and style should it take;
- what information should it contain; and,
- how could it be funded.

The research was split into two main sections; quantitative random surveys around the Estuary and at town centre sites away from the Estuary area, and; qualitative surveys of existing recreation users and service providers. The final recommendations of the consultants were:

- there is a clear demand for a leisure and recreation guide to the Mersey Estuary;
- the guide should take the format of a brightly coloured, modern and attractive looking pocket book, and the information contained in the guide should be available on the internet;
- the guide should focus on the unique features, character and diversity of the Mersey Estuary, and raise awareness of the recent clean up programmes. The research also provided detailed information on the specific information that should be included in the guide;
- the guide should be made freely available - the cost of producing the guide should borne through sponsorship.

As outlined earlier the Agency are working with the Mersey Strategy to identify additional funding partners to take the project forward through to production.

NORTH AREA

Habitats Directive

Area staff continue to contribute to the development of a scheme of management for Morecambe Bay and Solway Firth candidate SACs. (See photo below). Such management schemes will set the framework within which activities will be managed, either voluntarily or through regulation, so as to achieve the conservation objectives for the European marine sites. Management groups have been established (which include all relevant authorities of which the Agency is one) and the main task this year has been the production of draft conservation objectives by English Nature. The evaluation of the current use of the site against these objectives is now in progress.

Grazed Saltmarsh - Morecambe Bay candidate Special Area of Conservation

♦ Progress on the consents review

It is the intention to set up Area Implementation Groups to oversee the review process and in North Area the Eden, Ehen and Derwent riverine SSSI's which are also candidate SACs have been identified as priority sites to begin the process in 1999/2000.

Biodiversity

♦ UK Biodiversity Action Plan

Staff were involved with the development and implementation of the UK Biodiversity Action Plan, reflecting the importance of the biodiversity found in North Area

The Area provides National Agency co-ordinators for the following species and habitats;
freshwater pearl mussel, natterjack toad, reedbed and bittern, slender naiad, netted carpet moth, vendace and mesotrophic lakes.
Steering group meetings have been attended (North Area hosted the UK steering groups for river jelly lichen and vendace), Action Plans revised as necessary and the process of developing detailed work programmes begun.

♦ Cumbria Biodiversity Action Plan

The Agency is also a key partner in the local Biodiversity Action Plan process which is now well established, with the first tranche of plans due to be published early in 2000. Various area staff provide inputs into the steering, technical working and various focus groups associated with the process as well as drafting the vendace, mesotrophic lakes and river and streams plans.

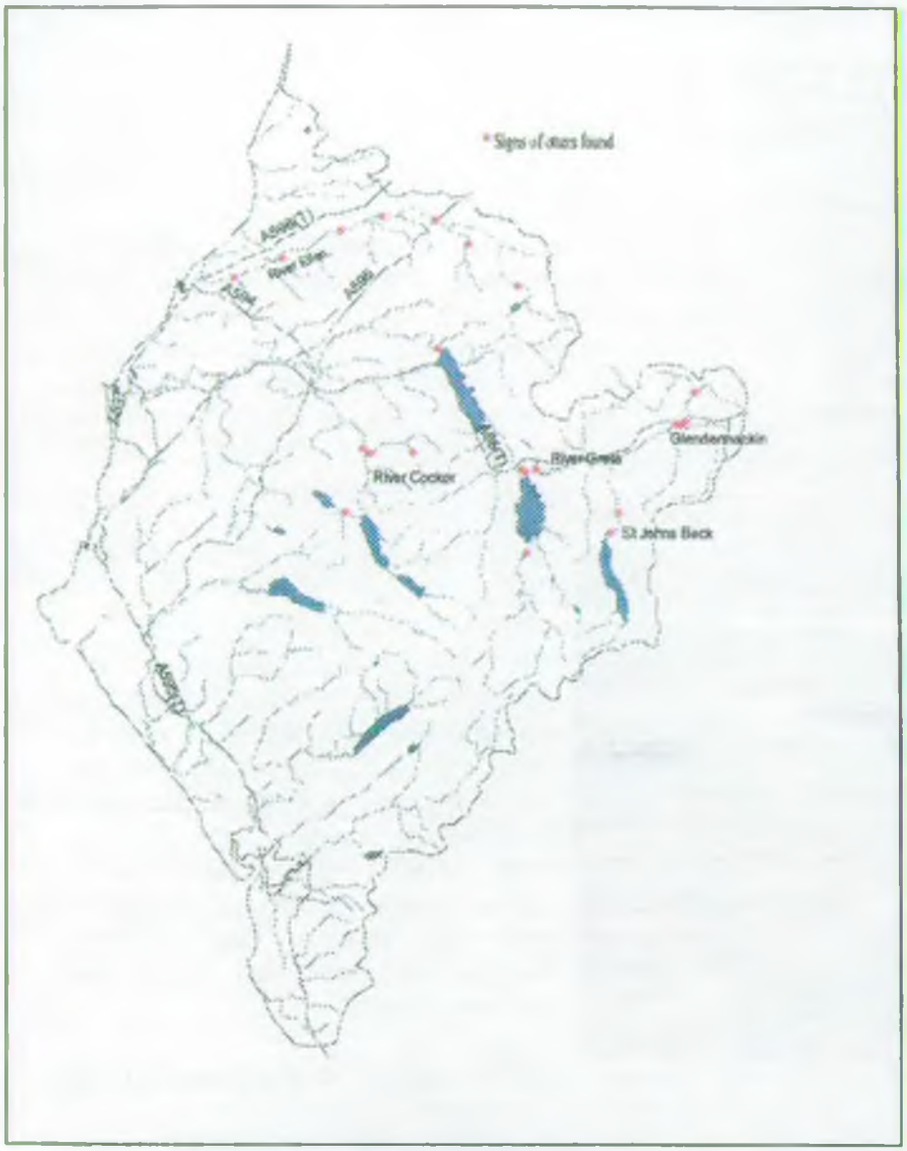
♦ Cumbria Pearl Mussel Survey

The 1996 collaborative project with English Nature, on the River Ehen mussel population, revealed it to be of international importance and resulted in the notification of the river as a SSSI / cSAC. During the research for this project it became apparent that mussels are found or have been known to formerly exist in a number of other Cumbrian rivers.

On the basis of information to hand, it appears that Cumbria may support the greatest number of pearl mussel rivers and streams in England. A collaborative project with English Nature and the National Museum of Wales has instigated a systematic survey of selected Cumbrian rivers to provide comprehensive, and detailed, information on present status, and the future conservation needs, of this important biodiversity species. The results will be reported next year.

♦ West Cumbria Otter Survey

At the conclusion of the Otters and Rivers project 1991 - 94 even the best rivers in West Cumbria were found to have only a low or transient population, and some areas were completely devoid of any evidence



Survey Results

of otters. There had been some evidence that the situation was improving (several road casualties confirmed otter presence), but there was a need to re-assess the situation as highlighted in the West Cumbria LEAP.

In May 1998 we carried out a follow up otter survey which involved one off site visits to as many road bridges as possible in a single day in the West Cumbria LEAP area (bridge abutments are favoured sprainting sites for otters).

Of 204 potentially suitable sites, 23 had evidence of otters. There was evidence for a strong otter population throughout the length of the River Ellen (later confirmed as a breeding population with a cub road casualty in December). Widespread distribution was also found on the upper Derwent catchment centred on the Greta, Glenderamackin and St Johns Beck and also on the River Cocker. (See map survey results)

It is pleasing to see that the spread of the otter down the west coast has continued unabated in the last 5 years since the end of the otter project, and their recent recolonisation into the central Lake District.

However, the survey method was not sensitive enough to detect the very low level of otters in the southern catchments of the Ehen, Irt, Esk and Mite, or on the lower Derwent catchment. Sightings and road deaths provide evidence that otters at least pass through some of these areas.

In future years, further surveys will hopefully continue to track and monitor the recovery of the otter population in Cumbria.

♦ River Kent Catchment Crayfish Survey

The Agency collaborated with English Nature during August / September 98, to undertake a survey to assess the distribution of the native white clawed crayfish within the River Kent catchment. Two members of staff were involved, setting and retrieving crayfish "trappies" and hand searching in allocated locations.

The results of this work confirmed that this catchment supports a healthy and well-distributed population of this protected species, both in the rivers (upper R. Kent, R. Sprint and R.Mint) and still waters (Dubbs and Borrans Reservoirs). It has been confirmed subsequently that these populations are significant enough to be considered as Nationally important.

♦ Ennerdale Charr and Liza Bridge

Liza Bridge... to be replaced

The Agency believes that the arctic charr population in Ennerdale Water is considerably smaller than historically. This particular population is thought to spawn entirely in running water unlike most other populations of char in England and Wales.

A major contributor to the apparent decline in char numbers is thought to be a pipe bridge in the lower reaches of one of the feeder streams of the lake. The pipe-bridge acts as a gravel trap starving the reach downstream to the lake of gravel. Historically this has been a very important spawning area for char.

The Agency has worked with the owners of the bridge, Forest Enterprise, to redesign this structure and has contributed to its replacement. Bridge reconstruction on site is due to be undertaken in early summer 1999. (See photo)

In the meantime, the Agency has reared char from Ennerdale broodstock and restocked 1000 fry back into the lake during 1998.

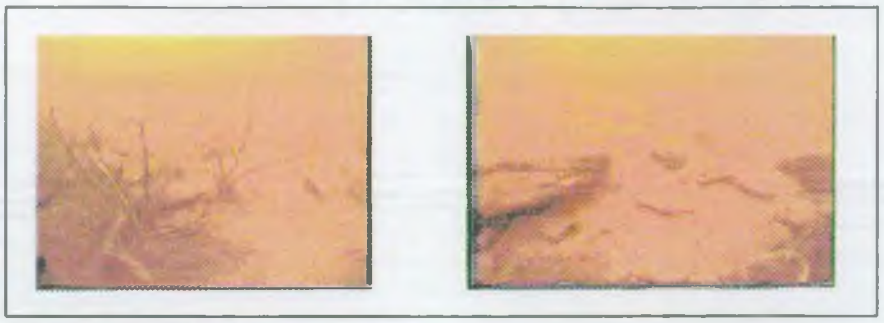
♦ Vendace Transfer Feasibility Study

The Agency has recently commissioned the Institute of Freshwater Ecology to carry out an investigation into the possible translocation options for vendace in Cumbria. The study is a parallel of the one carried out in Scotland to evaluate the possibility of re-establishing the species north of the border. It will examine physical, biological, chemical and human factors in an attempt to ascertain the most suitable sites for extending the distribution of the species.

At the end of March an initial list of 87 possible recipient waters had been reduced to 12 sites which were deemed suitable for further investigation. This work will take place in mid 1999.

♦ Vendace Spawning Grounds Study, Bassenthwaite / Derwentwater

English Nature, the Agency and the Institute of Freshwater Ecology (IFE) have recently completed a study of the status of the spawning beds in both lakes. The report concludes that potential spawning grounds in Bassenthwaite Lake were heavily silt laden with no or only very sparse cover of macrophytes. They are presumably therefore unsuitable for vendace spawning.



Photos above of the bed in Bassenthwaite

The photos above show that the bed of Derwentwater has much less heavy silt deposits and demonstrates a much denser cover of macrophytes

In order to investigate the sediments present in Bassenthwaite Lake the Agency has contracted IFE to identify the nature of the deposits and to try to ascertain their likely sources so that management options can be evaluated.

Assessment of Flood Defence Works

♦ Joint Management Plans

River Bela near Beetham

Multi-functional agreement was reached on routine maintenance operations for over 6km of the River Bela/Peasey Beck catchment in South Cumbria. (See photo). Walkover surveys involving Ecology, Fisheries and Flood Defence staff, resulted in an agreed management approach to safeguard fisheries interests, most notably non-disturbance of identified salmonid spawning riffles and good retention of marginal and bankside vegetation to provide adequate fish cover. Similar agreement was reached for some 2km of Grizedale Beck on the River Leven catchment.

This joint management approach is to be extended to the remainder of the River Bela catchment and to other routinely maintained watercourses with a significant fisheries interest.

River Rehabilitation

- **Renaturalisation of South Cumbrian Rivers**

South Cumbria has a number of small rivers whose lower reaches have little gradient and which have been heavily engineered in the past to allow for land drainage, railway and highway construction. The Agency identified the issue of renaturalising some of them in its South Cumbrian LEAP. A study was commissioned in December 1998 to look at relevant stretches of Rusland Pool and the Winster with a view to improving their ecological and fisheries value whilst not compromising land drainage issues. (See photo). The study examined ways of improving habitat diversity and the impact of alteration to channel profile on flood levels.

Rusland Pool – Renaturalisation of South Cumbrian Rivers

Development Control

The candidate SAC designation of the River Eden and Tribs, the River Derwent and Tribs and the River Ehen has required an increased level of assessment for many consent applications in these areas. The designations have also resulted in a significant increase in liaison with English Nature.

Water Quality Issues

- **Environmental Change Network (ECN)**

The UK Environmental Change Network is a network of sites designed for long term integrated environmental monitoring. The ECN aims to monitor change in selected plants and animals, in addition to the chemical and physical environment. There are 42 freshwater sites in the ECN, with only one riverine site in the North West, the River Eden at Temple Sowerby. Monitoring of macrophytes, diatoms, and freshwater invertebrates has been carried out at the site according to ECN protocols. Chemical and flow gauging data are also collected at the site, and a RHS survey undertaken.

- **Lakes Business Plan**

River Bela near Beetham Fisheries, Ecology and Recreation staff have contributed to the development of the North Area Lakes Business Plan which is currently in draft. This is a multifunctional protection and restoration plan for the important stillwater resources in North Area, dominated by the Lake District lakes. The plan reflects all the Agency's roles, developing strategies which meet the needs of sustainable environment and local economy and community. The plan recognises the paramount importance of co-operation with other agencies and interests, and that the Agency's statutory powers, in isolation, are insufficient to protect these "jewel in the crown" lake resources. In this context, the role of the Area Environmental Group Still Water Sub Group is particularly significant.

♦ Sheep dip pollution monitoring

Monitoring and investigation continued during the year, as a result of ongoing concerns about the impact of synthetic pyrethroid sheep dips on riverine invertebrate fauna. Biological monitoring at some 128 sites in the River Derwent catchment, in spring, summer, and autumn 1998 showed up five sites with significant toxic impact on the sensitive invertebrate groups attributable to probable sheep dip pollution. At previously impacted sites progress in recovery was apparent during the course of the monitoring programme. The catchment campaign included visits to sheep farms by environment protection officers, giving pollution prevention advice and where necessary outlining required remedial measures.

In other parts of the area, the rate of recording of depleted invertebrate fauna attributable to probable sheep dip pollution was markedly reduced relative to experience in 1997, although the high flows through much of the summer may have compromised detection, and enhanced drift recolonisation. Taking a more positive view, the decline could well be evidence of success for the Agency's considerable efforts in raising awareness of the problem, and solutions, though the continuing evidence of problems on the previously impacted Ehen and Caldew catchments serves to warn against complacency.

♦ Urswick Tarn

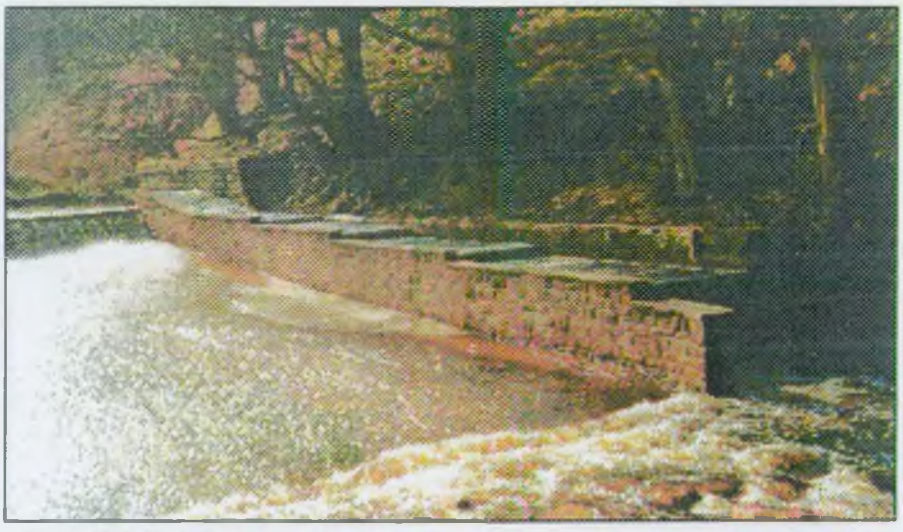
Urswick Tarn is a relatively deep 6Ha. Marl lake in a limestone catchment near Ulverston in South Cumbria. The tarn is a designated County Wildlife Site and is used by local people for passive and active recreation. A Management Plan has recently been produced and following a request from the Urswick Tarn Association, a repeat of the 1976 biological survey of the marginal macro-invertebrate fauna of the tarn was undertaken. Results indicated an apparent increase in the diversity of species recorded and slightly improved water quality.

Ecology and Flood Defence staff were invited to a meeting of the Association to discuss concerns over water levels in the Tarn and routine maintenance of the outflow stream. The opportunity was taken to highlight the importance of the reedbed / reed-fen areas around the tarn.

Water Resource Issues

♦ River Gelt Fish Pass

A fish pass has been constructed around the North West Water Ltd. abstraction point on New Water, the major tributary of the Gelt. The construction of the pass was made possible only after detailed negotiations between our Water Resources function and North West Water Ltd. (See photo).



River Gelt Fish Pass

Migratory fish now have access to several kilometres of spawning areas that were previously denied to them. In addition, the pass provides a safe downstream migration route for smolts and brown trout.

The River Gelt is a major salmonid rearing stream and is recognised as such being notified as part of the Eden and tributaries cSAC for Atlantic salmon. The opening up of this additional breeding area within the system will result in increased juvenile production and thus contribute to the maintenance of salmon populations at favourable conservation status within the European site.

♦ River Lowther Enhancement

As part of a programme of progressive environmental enhancement in the catchment, monitoring of the trial fish screens on Keld Gill, led to the conclusion that the screens at the water supply intake were only required to be in place from March to May inclusive. The purpose of the screens is to prevent the ingress of juvenile salmon and trout.

Negotiations with North West Water Ltd. are now being focused on the larger tributaries in the

catchment where current screening arrangements and residual flows are considered to be inadequate. This links to the Asset Management Plan 3 process. It is hoped to address the needs of at least one major tributary in the next few years.

Recreation and Access

◆ Furness Greenways Partnership

The Agency was invited to join this partnership in February 1999. Greenways are multi-use routes well designed so that people can enjoy access to the countryside in a (generally) traffic free environment on foot, bike or horseback. Greenways are also seen as an easy way for people to walk or cycle to school or work and generally as a recreational resource that can be used for fitness training helping people to adopt a healthier lifestyle. The Countryside Agency who are supporting a number of demonstration projects around the country is promoting this concept. The Agency's support for such initiatives occurs where the routes are alongside inland or coastal water and is detailed in the Memorandum of Understanding with the English Sports Council, the Countryside Commission (a predecessor body of the Countryside Agency) and the Environment Agency.

One such demonstration project has been set up in the Furness area of South Cumbria (the Furness Greenways Demonstration Area) and possible route "corridors" that have thus far been identified include routes along water. A draft strategy has been drawn up and community consultation is underway.

◆ Tourism and the environment conference

The Agency co-sponsored the above conference, which was organised by the Lake District Tourism and Conservation Partnership in March 1999. The aim of the conference was to share experiences of public, private and voluntary sectors involved in balancing the needs of the environment with those of visitors to the Lake District and its local community.

◆ Use of Public Fishery on Coniston

The Agency leases the fishing rights to Coniston Water. Anyone who holds a valid fishing licence may fish this lake free providing they hold a valid Environment Agency fishing licence. Access to the lake must be by permission of the relevant owner.

CENTRAL AREA

River Rehabilitation

- **River Darwen Improvements, Witton Country Park**

The first phase of a three-year improvement project on the River Darwen has been completed. The project will establish a 1300m long surfaced path on one side of the River Darwen where it runs through Witton Country Park in Blackburn. Although the river runs through the centre of the park it is not a feature. The Agency wanted to make a more interesting and attractive river corridor for people to enjoy. The river had in the past been over-widened and straightened and there was a need to restore some of the habitats and river features that had been lost.

The first phase consisted of two areas of work, 1) recreation/amenity works and 2) habitat

Witton Park Before

improvements.

1) **Recreation works**: at the main entrance to the park a surfaced path down to a viewing area by the river was laid out. A bench and interpretation board was also located here. The path then continued to the first bridge. In later years the path, which is of a suitable standard to accommodate wheelchair users, will extend downstream to run the full length of the country park. This footpath will also pass some of the habitat improvements that the Agency have made, as outlined next.

2) **Habitat improvements**: in the middle of the park there is a small field by the river that is grazed by cattle and has the remnants of the old river course still evident. In this area the old river arm was excavated and re-connected

Witton Park during work

to the main river channel, thereby creating a back water which has been planted with aquatic plants. Topsoil was stripped off the surrounding land and then seeded with a wet meadow wildflower mix which will be managed, once established, by simply allowing cattle grazing after flowering. This will give people a flavour of the beautiful and diverse lowland wet meadows which would once have existed on this site.

Just down stream on the opposite bank a wet ledge has been created by lowering an existing berm and extending it slightly into the river to narrow the over wide channel. This area has been stabilised with coir logs, matting and aquatic plants. The surrounding banks were also stripped of topsoil and sown with a collection of vigorous and competitive wildflowers that will persist without management.

Agency partners in the project included the landowners, Blackburn with Darwen Borough Council and the Darwen River Valley Initiative. The project so far has received praise from park users and attracted media interest with newspaper and radio coverage.

Multifunctional Projects

- **Sandwath Pond Creation, Weasdale, Upper Lune**

This project was created to alleviate a problem of recurrent flooding of a field and an adjacent landowners property. Sandwath is situated near Dry Beck, which is an artificially straightened, raised watercourse, several metres higher than the surrounding fields. It has undercut its heavily repaired

Sandwath Pond Creation

concrete base. Most of the time the water in the beck flows underground but during periods of high water flow it fills its artificial channel and flows up through underground springs into the field causing localised flooding of Sandwath and flows into the adjacent field and occasionally the adjacent property.

The Sandwath project has created meandering streams, from the springs, leading to two large ponds. The outflow streams from the two ponds converge and flow into Wythe Beck. (See photos). The scheme not only provides wetland habitat, but adds to the visual amenity and landscape character of the area. This is especially notable as a public footpath runs over Wythe Beck, at the bottom end of the field, to Dry Beck at the top. The landowner is keen for walkers to admire the wetland habitat so additional footbridges have been incorporated to allow access over the new streams.

Many broadleaved trees have been planted as part of the scheme to increase the shelter of this quite exposed area. The trees that were rescued by Lancashire County Council from a bankrupt tree nursery are a mixture of native and exotic varieties and were donated to the Agency for use in environmental improvement schemes. Lancashire FWAG have done a survey of the land for environmental enhancements and possible grants towards the work.

Sandwath Pond

♦ Forton Village Pond

Ponds constitute a valuable aquatic habitat and a traditional landscape feature of the Fylde district. Once numerous, they are being lost in significant numbers, largely through neglect or development. Although situated in the village centre, Forton Village Pond was in a state of semi-

Forton Village Pond

neglect, suffering a number of problems, including erosion from stock poaching, failed and untidy fencing, extreme shading from overhanging trees and litter. The Ecology Unit received a prospective project outline from Forton Parish Council, with the following objectives:

1) To improve the pond for wildlife and ensure its continuing existence at the village centre.
2) To provide educational opportunities for the local school and community.
3) To forward Environment Agency objectives of the "promotion of ponds and pondscapes through publicity and education" (Wyre LEAP 1997).

Working in partnership, the plans to improve the pond were carried out, including preliminary surveys, arranging a lease for the land and legal fees, litter clearance, fencing, tree works, hedge and wildflower planting, footpath work, boardwalk and dipping platform construction and provision of safety throw line. A signboard is yet to be designed and installed. Press coverage has included updates in the parish newsletter, and a forthcoming item in the local paper. Main contributors were Forton Parish Council, Lancashire County Council, Wyre Borough Council Countryside Rangers, Myerscough College Arboriculture Unit, Lottery Small Grants, local volunteers and children from the local school.

Water Resources Related Work

♦ Low Flow monitoring in Central Area.

Following the 'drought years' and the resulting greater demand for water from our rivers and reservoirs, a number of special monitoring sites were set up for biological monitoring by Ecology and Water Resources to try and gauge the effects that the reduced flows were having. This monitoring has continued and now forms part of the routine sampling programme. Sites have been identified which are, or could be, affected by drought orders from reservoirs, intakes or abstraction points. These are sampled twice a year and then analysed, identifying the invertebrates to species level. In conjunction with the biology sampling there is a programme of fisheries surveys at the same sites. Sites which may be under particular stress, such as the Brennand and Whitendale rivers on the Hodder system, also have flow data taken at the time of sampling.

It is hoped that this data collection will form detailed baseline information. As the effects of low flows on the ecology of watercourses becomes better known, this baseline data will provide an effective tool in assessing the amount of water needed to sustain current ecological status.

Linked to this is a project to try and ascertain 'River Flow Objectives'. The Ribble catchment is the trial catchment for this study. Using water quality, fisheries and ecology data; physical catchment data and the local expertise of people working on the catchment, assessments are made of the current status of the watercourse. This is linked with abstraction and discharge data to assess whether the flow regime is a limiting factor to ecological improvement and ascertain how easy it would be to change the flow regime.

This tool should help to identify areas which are most impacted by abstractions and identify areas which could most easily be improved.

Environment Agency Landholdings

The Agency owns and manages 6 sites for recreation in Central Area. During 1998, the Agency has reviewed its management and pricing structure for Agency fisheries on the rivers Lune and Ribble. Given the current international concern over the status of salmon stocks, the Agency instituted a catch and release policy for salmon on all of its fisheries from September 1999 and reduced its ticket prices accordingly. In addition, the Agency has continued to manage Pilling Lane Amenity Area for the benefit of the public through a contract with Wyre Borough Council.

♦ Pilling Lane Ends Wildlife Open Evening

Lane Ends is one of the very few Agency-owned conservation and recreation sites in the North West, and is intensively used by locals and visitors to the area as a site for informal recreation.
The aim of the Wildlife Open Evening was to demonstrate that the site is more than just somewhere to walk the dog, and was an opportunity to introduce the local users to the diversity of wildlife that can be found there. The response was very encouraging when, despite appallingly wet weather, about 30 people turned out. The site is the subject of a continuing program of habitat improvement works, which were highlighted and explained. The program of activities also included a talk by the bird ringing

group who work there, pond dipping, and mini-beast hunts; but the weather was too wet for any successful bird watching or bat detecting. The event was held in conjunction with the Wyre Borough Council Countryside Service Rangers and their volunteers, who manage the site on our behalf.

Water Quality Issues

- **Blue Green Algae at Hall Lane Nurseries, Longton**

Blue-green algae are natural inhabitants of many inland waters. Excessive algal growth can develop into a bloom, turning the water bright green, and on calm days a dense brightly-coloured scum can develop across the water surface, which is often mistaken as a paint spillage.

We were alerted to a market garden nursery where the owner was concerned that his irrigation reservoir had been vandalised by someone throwing in green paint. Microscopical examination of a water sample confirmed our suspicions of a dense blue-green algae scum, of the species *Microcystis aeruginosa*. The water had been used to irrigate a lettuce crop, so it was imperative to determine whether the algal bloom was toxic or not.

A sample was sent to consultants at the University of Dundee for analysis. The sample was acutely hepatotoxic, with high concentrations of the toxin microcystin. With such high toxicity, concern was

Blue Green Algae

raised about the safety of the lettuce crop. The laboratory found colonies of the toxic algae adhering to the leaves; and analysis of the plant tissue demonstrated that the toxins were also present in the lettuce itself, making them unfit for consumption.

The uptake of such toxins by crops has been studied in laboratory conditions, but this was the first time that plant material that had been exposed to the algae via spray irrigation had been examined. MAFF were informed as a matter of routine, but their standard letter of advice to the nurseryman did not include any recommendation to remove the crop from market. In this case the nurseryman was genuinely concerned about public safety, and volunteered to destroy his crop.

- **Biological monitoring of the River Ribble following a discharge of Synthetic Pyrethroid (SP) sheep dip**

In September 1997 there was a discharge of SP sheep dip to the River Ribble, upstream of Horton-in-Ribblesdale. There was considerable damage to the river fauna down as far as Long Preston Deeps, a distance of about 15km. Biological surveys were undertaken as part of the immediate investigation of the incident, and further work was done to monitor the response of the river fauna in the longer term.

The initial impact was typical of SP dip: river invertebrates – flies, nymphs, shrimps, crayfish, worms and snails, were killed. Fish were not directly affected. The effect was readily detected as far downstream as Cleatops Barn, downstream of Settle WWTW. Many species were not found in the samples, while others were present in very low numbers.

The incident was detected when an Ecologist investigated a report from a member of the public of dead crayfish in the Ribble. Crayfish are a nationally threatened species, and the Ribble population is very important. None were found alive downstream of Birkwith at the time of the incident, though they have now started to recolonise naturally.

The upper Ribble is a very important area for trout and salmon spawning and fry. Although fish were not killed directly, they may be stressed by a lack of invertebrate food animals.

Monitoring has revealed a progressive recovery. Eight months after the event the invertebrate community had reinstated itself. There does not appear to have been any permanent damage, and in the absence of further pollution stress there should be a full recovery this year.

An extensive survey of the Lune and Ribble Catchments will take place during 1999 to assess the extent of sheep dip contamination.

Flood Defence

As part of their routine maintenance programme and capital works programme, the Agency's Flood Defence department carry out work which either directly or indirectly benefits the recreational amenity of the area, the following are some examples:-

- **River Lune Millenium Bridge - Lancaster**

The Agency is a partner in a project to construct a Millenium Bridge over the river Lune at Lancaster. The bridge will provide a foot and cycle way to join the riverside park on the south side of the river to Lancaster on the north bank. The Agency's Water Services Department has contributed £75k to this project and provided advice on the construction and installation of the bridge. Construction work on the bridge is due to begin in 1999.

- **Crossens Sea Embankment**

As part of a scheme to improve the flood defence of Crossens sea embankment, the crest of the flood embankment was widened. This area is currently designated as a public footpath and the effect of the work was to improve the footpath for public use.

- **Footpath Creation, River Wyre**

When a local landowner gave permission for ramblers to use his land for a footpath along the river Wyre between Gubberford Bridge and the Railway bridge at Scorton, Flood Defence gave their permission for the top of the flood bank to be used for this purpose.

- **Cockersands Sea Defence**

As part of a scheme to rebuild part of the flood bank and strengthen the Cockersands sea defence at Cockerham, the Flood Defence team had to remove part of the existing hedgerow. In mitigation for this work, 6000 trees were planted at the back of the embankment and a 0.25acre wildlife pond was created for the landowner.

- **Habitat Improvement on Rivers**

Flood Defence continually seek to use sustainable management techniques to strengthen river banks and prevent flooding. In 1998, the Flood Defence department has used willow raddling, tree planting and other soft engineering techniques for this purpose. Not only have these techniques proven to be a good value for money option for flood protection, but they also improve the wildlife habitat of Lancashire's rivers for birds and small mammals whilst providing cover and a food source for fish.

Recreation

- **Platforms for disabled anglers – River Ribble at Clitheroe**

Angling facilities for the disabled are few and far between on Lancashires' rivers. The Agency has worked in a 50% partnership with Ribble Valley Borough Council to install two fishing platforms for disabled anglers on the river Ribble at Clitheroe and improve an access path to the river that is commonly used by young local anglers at a cost of £16.5k. The platforms were designed with the assistance of disabled angler and radio presenter Martin James. The construction of the platforms is complete and an official launch of these facilities will take place during the summer of 1999.

- **Platforms for disabled anglers – The Sluice at Banks**

Work has commenced on a collaborative project to install three platforms for disabled anglers on The Sluice at Banks. This project was initially started several years ago and is about to come to fruition. The Agency, North West Water Ltd., West Lancs. District Council and Southport and District Anglers have worked together on this £40k project. The project includes installation of a car park for disabled anglers, access ramps to the fishing platforms suitable for wheelchair use and construction of three adjacent platforms which will partially overhang The Sluice. The platforms will be constructed on Agency owned land by Agency staff in an area where the fishing rights are already leased to Southport and District AA. The Angling Club operate a day ticket scheme for non members. The car park has been constructed on District Council land and North West Water Ltd has provided all materials for the project. Again, an official launch of these new facilities will be organised for the summer of 1999.

- **Forest of Bowland Area of Outstanding Natural Beauty Joint Advisory Committee.**

The Agency has been forging closer links with the Joint Advisory Committee (JAC) that manages the Forest of Bowland Area of Outstanding Natural Beauty (AONB) under the auspices of Lancashire County Council and many other statutory and non-statutory bodies. This year, Agency staff attended the Technical Officer's Committees of the AONB and contributed to their business-planning workshop. The Agency also contributed £3k towards recreation projects within the AONB that either improved access to rivers or the visual attraction of riversides. In 1998, Lancashire Countryside Service completed 11 water related projects using JAC funds costing £23.5k. These projects included improvements to Hornby Riverside Path; Spout Brow Path (Wray), Robin's Close Meadow (Hyndburn); Crook O'Lune (Lune); Shay Wood (Slaidburn); Cross of Greet (Hodder); Newton (Hodder); Abbeystead Reservoir (Wyre); Hall Gill access improvements (Wyre); Roeburn/Hunts Gill Beck (Roeburn); Tatham Parish (Hyndburn). In addition, the JAC has promoted two circular riverside walks at Gisburn and Downham (Ribble). There have also been noticeable benefits from the liaison and joint working between staff from the Agency and Lancashire County Council.

- **Canoe Access Agreement - Upper River Lune**

Agency staff have initiated negotiations between landowners, canoeists and other river users in an attempt to reduce a current conflict of use on the upper middle river Lune. It is hoped that an access agreement can be forged which is agreeable to all parties for the multiple use of the river in this area. These negotiations are still continuing.

- **Boating/Canoe Access Agreement - River Lune, Lancaster**

The Agency has been requested to facilitate negotiations between Lansil Angling Club and various rowing and canoeing clubs on the lower river Lune at Skerton (Lancaster). Lansil have expressed concern at the increasing level of boating/canoe use on the river where they hold fishing rights. The boaters wish to pursue a lottery bid in association with Lancaster City Council to build a boating centre on the banks of the Lune at Lancaster. These negotiations have started positively and will continue into 1999.

- **River Wyre Canoe Trail – Garstang**

Agency staff have contacted local angling clubs and some owners on the lower river Wyre with a view to progressing a canoe trail on this part of the river. So far, angling club representatives have expressed no desire to even discuss this proposal. Efforts will continue in 1999.

- **Wigan Flashes User Group**

The Agency attends meetings of the Wigan Flashes User Group, a group which discussed the use of Wigan Flashes with various user groups, statutory and non-statutory bodies. This Group has just appointed a new project officer and it is hoped that the Agency will be able to develop collaborative recreation projects in association with the users to benefit all members of the public in Wigan in 1999.

- **Liaison with Other Statutory and Non Statutory Bodies**

Agency staff have continued to build closer working relationships with other bodies through attendance at meetings and increased liaison. Agency staff in central Area regularly attend Public Rights of Way Meetings run by Lancashire County Council and have held workgroup meetings with Yorkshire Dales National Park and Lancashire Countryside Service to identify areas where their roles overlap with those of the Agency, to get best benefit from limited resources.

- **Bowland Tourism Environment Fund**

This is a new initiative with Ribble Valley Borough Council, the Tourist Board, the Bowland Initiative and Lancashire Wildlife Trust. This project will set up a fundraising group to raise funds from the local tourism industry, for environmental and recreation projects within the Bowland Area. The Agency contributed £2k towards the set up costs for this project that was match funded by other partners. This project will develop further in 1999.

SOUTH AREA

Projects

♦ Frodsham Marsh

The Agency, has, in collaboration with RSPB, created valuable wetland scrapes in a field adjacent to the River Weaver at Frodsham Marsh. The site became available for habitat enhancement due to the Countryside Stewardship Scheme encouraging farmers to improve the ecological value of their land. The Marsh is a recognised stronghold for breeding lapwings in the North West, and the scrapes will provide more suitable land for the birds to nest and rear their young. The scrapes will retain shallow, invertebrate-rich water, which during the summer months will provide a vital source of food for lapwing chicks.

Frodsham Scrapes

♦ South Area Stillwater, Meres and Mosses Strategy

The Meres and Mosses are an internationally important series of open water and peatland sites in the North West Midlands. The Meres have developed in hollows formed during the retreat of the last glaciers and are often associated with a variety of wetland habitat types which show natural progressions from open water, through swamp and fen habitats, to wet willow or alder woodland. The Meres are particularly important for aquatic plants, insects, molluscs and birds which are dependent on open water habitats and fringing vegetation.

A large proportion of them are designated as Sites of Special Scientific Interest and many others are designated as of local importance, being County Wildlife Sites or having features of nature conservation interest. Some are RAMSAR sites, designated as such because of their importance as wetlands with particular importance for birds.

The Agency has a responsibility to protect and where possible enhance stillwaters in the region. A stillwaters strategy is being formulated whereby sites may be prioritised for action and resources focused efficiently. A large database of information has been produced, for sites larger than two hectares, that will be updated in the future to include smaller stillwaters in the area.

The Agency is embarking on a major study of the Meres and Mosses and their catchments in collaboration with English Nature. The study will encompass those natural wetland sites of glacial origin in the Meres and Mosses Natural Area which are notified as SSSIs with a number of connected sites also being included. The project will provide the information necessary for effective conservation management, and in some cases, enhancement and restoration of degraded communities at relevant sites.

Assessment of Flood Defence works

- **Three year habitat enhancement programme on the River Weaver, Nantwich.**

The three-year Agency works programme on the River Weaver, at Nantwich, is underway with the first tranche of pollarding works begun in March. This area of the River Weaver flows though an amenity and public open space area known as Nantwich Riverside, owned and managed by Crewe and Nantwich Borough Council. The area was previously intensively managed. However, recently there has been more emphasis on management for nature conservation. The Agency's Ecology section has been actively involved in providing advice for the works on this section of the River Weaver, aiming to enhance the existing river corridor's wildlife potential.

Pollarded trees R iver Weaver

The main works for the 3km length of the River Weaver are to de-silt the river channel over a three year programme, reducing the risk of flooding in this large conurbation. Other habitat enhancement works included within the scheme are resetting of a culvert level to an old ox-bow and de-silting the channel, tree management including pollarding of mature bankside willows, tree planting, pond management, otter holt construction and creation of marginal berms. All of which are aimed at improving the river corridor for new and existing wildlife such as kingfishers and water voles, and the local public that use the area extensively.

- **Flood Alleviation Schemes, South Area 1998/99**

South Area's Ecology section has been busy in the past year with a number of current and proposed flood alleviation schemes. The largest scheme is situated on the Etherow, where work is ongoing upstream of Woolley Bridge, Glossop. A smaller scheme is due to begin on Black Brook (a tributary of the Goyt) during the summer.

Ecology have been involved in both schemes from their conception, advising on both possible impacts, and proposing environmental mitigation and/or enhancement work during the design stage. Ecological involvement in the two schemes during 1998/99 is summarised below:

- **Etherow Flood Alleviation Scheme**

Agency Ecology staff have maintained a presence on site during environmentally sensitive work, and attended monthly progress meetings. Ecology's continued involvement during the construction phase has ensured minimal ecological damage. Contributions made by Ecology have included:

- Design of planting schemes to mitigate against

losses during construction (at Etherow Industrial Estate, Melandra and Hadfield Brook);
- Incorporation of recesses in the new flood wall design to encourage nesting by dippers/wagtails;
- Incorporation of fish ledges in the new flood wall design to improve bank-side cover for fish;
- Retention of Black poplar hybrid upstream of Woolley Bridge; and
- Consultation regarding design of stone facing for flood walls.

Ongoing construction work during 1999/2000 will require continued involvement from the Ecology section.

- **Black Brook Flood Alleviation Scheme**

Ecological work on this scheme included protection of a white-clawed crayfish population in a tributary downstream of Chapel-en-le-Frith, High Peak. Concerns were raised by Ecology regarding the presence of crayfish at the confluence of Black Brook with this tributary. (See Biodiversity section). Fortunately plans for construction work in this reach of Black Brook have been abandoned

Environment Agency Landholdings

- **New revised conservation management plan for Davenham Depot.**

A new five year management plan for the Davenham Fisheries Depot will be produced at the beginning of May. This will be the continuance of the first management plan produced in 1992, with the aim of further increasing the wildlife potential of the 2Ha site, near Northwich.

Water Resources Related Work

- **Drought monitoring**

In early 1999 a working party was set up with representatives from Water Resources, Ecology, Environmental Planning and Environmental Protection to produce a multi-functional programme for monitoring rivers likely to be affected when Drought Orders are put into effect during a drought year situation. Biological and fisheries programmes are to be initiated for routine surveillance, which will be augmented in drought year situations.

Water Quality Issues

- **Pollution Source Investigations (PSIs)**

The Ecology Team have carried out a range of PSIs across the Area PSIs carried out in the Weaver / Dane catchment included:

- Monitoring the cumulative effect of septic tanks on Rookery Brook;
- Historical industrial waste pollution at Parrot's Drumble with respect to a decline in watervole population in the Site of Biological Interest;
- A slurry pollution on Marbury Brook;
- Monitoring of the impact of NWW Ltd sewer outfalls at the Knightsgrange estate in Winsford.

- **Minewaters**

A minewater survey is underway on Borsdane and Hockery Brooks in the River Glaze catchment in conjunction with Environmental Protection and Water Resources. This has been highlighted as an issue in the LEAP. Chemical, macroinvertebrate and hydrological information will be assessed following two sampling seasons (February and August), and

Minewater River Glaze

recommendations put forward to remedy the problem if necessary.

♦ Old Meadows Acid Mine Project

For years the upper reaches of the River Irwell have been severely affected by acid mine water discharge from Old Meadows, upstream of Bacup. This has produced unsightly orange ochreous deposits and severely limited the aquatic life of the system. A treatment plant was installed early in 1999 and biological monitoring is taking place in order to measure the benefits of the scheme.

♦ Invasive weeds

The spread of alien invasive weeds in South Area continues to cause concern. The giant hogweed control programme continued into its fourth year, and £30,000 was spent on applying herbicide to all known river bank colonies in the area. Unfortunately, the rather wet conditions experienced in the summer of 1998 considerably interfered with the operations.

Japanese knotweed is emerging as an even more significant problem, as it invades extended lengths of river bank, causing considerable damage to flood defences, both earth banks and hard structures like walls. The Agency is looking to produce a management policy for dealing with this new threat. Invasive alien pond weeds such as Azolla (Fairy Fern) and Crassula (Australian swamp stonecrop) are also causing concern as their distribution continuously increases, and the Agency is conducting a publicity campaign to alert the public to the problems they cause.

Biodiversity

♦ Crayfish Investigations

The native, or white-clawed crayfish has been designated as a species of priority concern in the UK's Biodiversity Action Plan Steering Group Report.
Present information indicates that the native crayfish is restricted in South Area to the Dane and Weaver catchments, in Cheshire, and the upper Goyt catchment in the Peak District of Derbyshire; this does not, however, mean that it is absent from other locations in South Area. Recent surveys have shown that native crayfish populations are generally very localised, the exception being Basford Brook, a tributary of Valley Brook to the south of Crewe.

Recent work by Agency Ecology staff in the Goyt catchment has revealed the existence of native crayfish in a tributary of the River Goyt. The population has been found in Wash Brook, (good biological quality), down to the confluence with Black Brook, (fair to poor biological quality). Crayfish are only found in Black Brook in the vicinity of the confluence. The habitat along the rest of Black Brook appears suitable for native crayfish and, therefore, water quality is likely to be the limiting

Native Crayfish

factor.

Any improvement of water quality in the Goyt, however, may turn out to be a mixed blessing. The presence of a thriving population of non-native signal crayfish, (*Pacifastacus leniusculus*), in Hollywood End Brook, a tributary of the Goyt, is a cause of some concern. Signal crayfish could colonise the Goyt in the near future, especially if water quality improves. Should this occur, they could rapidly colonise the main river upstream of this point, and could eventually displace native crayfish from their stronghold in Wash Brook. The status of both crayfish populations in the Goyt and its tributaries, therefore, needs continued monitoring.

♦ Water vole investigations

Sankey Brook is a typical example of the kind of degraded watercourse that is still common in the Merseyside conurbation north of the Mersey Estuary. Heavily over-managed since the early 18th century (when the Sankey Canal was constructed) and affected by 150 years of the chemical industry in St Helens and Warrington, this is not the first place you would think of as a home for endangered species. There were however a number of ad hoc records of water voles from throughout the Sankey catchment.

Sankey Brook downstream of the M62 and Whittle Brook, a nearby watercourse and site of a recent river rehabilitation scheme, were surveyed for watervoles

during the Summer of 1998. The surveys were a collaborative effort involving the Agency, Cheshire Wildlife Trust and Warrington Ranger Service. The results gave ample evidence of a healthy population through numerous field signs, and even some actual sightings of the animal itself,. It seems that, despite poor water quality and degraded habitat, the water vole is alive and well and living in the Sankey at Warrington.

For the future there are further watervole surveys planned for 1999/2000 including the River Glaze (adjacent to although not directly connected to the Sankey), and a larger scale survey covering the whole of Merseyside, which is being carried out as a collaboration between Lancashire Wildlife Trust and the Agency, (South and Central Areas). Watch this space.

Development Control

♦ Manchester Airport Runway 2 Development

The revised deadline for completion of Runway 2 is May 22nd 2000, extended from January 28th 2000.

The structure of the Bollin Tunnel is now complete except for stone facing of the portals and the mammal corridor of logs which will run along the access way. Earth has been placed across the tunnel to fill in the valley on both sides of it. Bat boards have been placed in the roof at both entrances to the tunnel and lighting alongside the Bollin Valley Way has been installed. The water through the tunnel is still artificially high but will drop to its intended level when the weir downstream is removed later on this year.

Downstream of the tunnel approximately 800m of the River Bollin will be rehabilitated by the creation of three new meanders. This is part of the mitigation package associated with the Runway 2 development. The design is well underway and work will begin on site later this summer when the Agency and the Local Planning Authorities have approved the drawings. Before earth is excavated, a variety of surveys have been commissioned so that the future success of the work can be monitored. These include invertebrate samples, River Habitat Surveys, a geomorphological study, records of aquatic plants and a fisheries survey (July 1999).

A tributary of the River Bollin, Sugar Brook has been diverted into its new channel. A wildflower seed mix has been sown on the banks and marginal plants placed along the channel edges. At the confluence of Sugar Brook with Woodend Lane Bk. a reed bed has been planted.

Under the new runway a drainage system is being installed so that all water from the surface of the runway can be contained in large balancing and settlement lagoons. Uncontaminated drainage will be discharged to the River Bollin. Water not achieving the necessary high standard for any reason will be diverted for treatment by North West Water Ltd. Six sets of temporary settlement lagoons currently take site drainage and treat it before discharging through consented outfalls to the nearest watercourse.

The Agency continues to be closely involved in the runway 2 project via a Project Team set up in 1997. Close liaison with all parties has enabled us to influence all relevant stages of the construction process.

♦ New bypass and industrial areas encroach on Sanderson's Brook Valley

The next stage of the Mid-point 18 development area is now in full swing with extension of Middlewich Bypass and proposed new ERF truck plant all within close proximity of Sanderson's Brook, Middlewich. The developers have been in discussions with the Agency to consider concerns regarding the proposed new bypass extension and siting of truck plant. New revised drawings and mitigation package are under discussion.

♦ River Croco diversion at Middlewich

Following negotiations with Tesco, and their architects, the Agency has now granted consent concerning the diversion of a 400m section of Croco Brook, at Middlewich, as part of an expansion scheme for the Tesco distribution centre.

The diversion, upon receiving the necessary planning approval, offers an opportunity to improve the ecological quality of the existing stream and its riparian corridor. The proposed new river corridor has been designed with the aim of increasing the variety of habitats compared with the present corridor. The new river corridor will have greater sinuosity, varied bank and channel profile, marginal and backwater areas and extensive grassland, scrub and woodland areas, within a wide buffer strip.

Recreation

- **Walking the Wirral**

One of the LEAP actions to come from the Lower Mersey LEAP was to look at ways of increasing access and awareness to the areas watercourses, thereby increasing ownership and value. Attention has focused initially on an area of the Wirral, where the Agency has joined forces with the River Valley Initiative, RIVA 2000. The partnership has delivered many outputs that support the Agency's aims for recreation. Listed below is some of the work in which we have been involved.

- Walks Folders

The Agency funded the production of information folders that are to contain leaflets on walking routes on the Wirral.

- Waymarking signs

Waymarking signs have been designed. There will be a mix of wooden finger posts where a path leaves the road, "way marking" along streams/rivers and possibly directional arrows in residential areas.

- Road signs

The Agency gave funding for road signs naming rivers and for waymarking signs. 31 locations for the signs have been identified (17 on the River Birket and tributaries and 14 on Dibbinsdale Brook and tributaries).

- Waterside Wirral

A book entitled Waterside Wirral has been created jointly by Mersey Basin Trust (including members of RiVa 2005), the Ramblers Association and Bluecoat Press. Waterside Wirral is the first in a series of books about watercourses in the Mersey Basin. It focuses on routes for walkers, cyclists and horse riders along rivers, streams and valleys and includes general information about Wirral's natural history, streams and rivers and maps of the area.

Agency Looks into The Past – Industrial Archaeology

The Agency has a duty to have regard to the importance of archaeological features when carrying out its works. However, we know very little about the archaeology within our rivers. This lack of knowledge has been identified in many LEAPs within the North West Region. Given the potential archaeological importance of the north Manchester area a decision was made to target the Roch, Irk, Medlock catchment. The Agency joined with Greater Manchester Archaeological Unit and commissioned Lancaster University Archaeological Unit to investigate the archaeology in the catchment.

They studied all the main designated rivers in the Roch, Irk and Medlock areas using maps to locate possible archaeological features within 10 metres of each river. They then went out to investigate a proportion of those features on the ground. The results increased the number of known archaeological sites within the study area by 397%! The data has been placed onto the Agency GIS system and so can now be used for screening land drainage consents and to help anyone in the Agency who wishes to carry out works to the rivers to take into account the archaeological impact of their works.

Further surveys are planned for this coming year in the Croal and Irwell catchments and in years to come it is hoped to survey all catchments in the South and Central Areas.

APPENDIX

PERFORMANCE MEASURES AND STANDARDS OF SERVICE 1998/9

Conservation and recreation activities have performance measures which are monitored quarterly and annually to assess compliance. Some results appear in the Annual Report and Customer Charter. Most measures aim to ensure services are delivered within target times in 90% of cases, and in general, conservation and recreation usually meet or exceed them.

RECREATION 1998/9

ACTIVITY	ITEM	TOTALS
PROMOTION & ADVISORY SERVICES	No. of requests for Recreation advice responded to in target time	501
	No. of completed recreation projects involving external collaboration	4
	Total No. of recreation projects completed	4
FACILITY MANAGEMENT	No. of Agency landholdings with potential for recreational use	9
	No. of Agency landholdings actually used for recreation	8
	No. with public access	7
	No. of site management plans implemented	4
PLANNING & DEVELOPMENT CONTROL	No. of Agency planned capital works schemes screened for recreation	17
	No.of referrals responded to by deadline requested :	807
IMPROVEMENT	No. of Agency new capital schemes incorporating recreation work	5

CONSERVATION 1998/9

PROMOTION & ADVISORY SERVICES	No. of requests for conservation advice responded to in target time	503
	No. of completed conservation projects involving external collaboration	8
SITE MANAGEMENT	No. of site management plans implemented	0
OPERATIONAL APPRAISAL	Total length of river (km) surveyed (Reactive survey only)	74
	No. of river habitat survey (RHS) sites completed	117
PLANNING & DEVELOPMENT CONTROL	No. of Agency planned capital works schemes screened for conservation	29
	No. of Agency new capital schemes incorporating conservation work	11
	No. of Flood Defence maintenance works	158
	No. of Flood Defence maintenance works assessed for environmental impact on rivers,estuaries and coastline	43
	No. of flood defence maintenance works audited to ensure compliance with agreed recommendation/specification	9
	No. of flood defence works complying with agreed specification	9
	No.of referrals responded to by deadline requested	2671
IMPROVEMENT	No. of completed projects	
	Total cost of completed projects (£k)	

CONSERVATION RESOURCES IN THE NORTH WEST

DID YOU KNOW THAT?-

- There are 409 Sites of Special Scientific Interest (SSSIs) in the Region.
- There is over 534km of Cumbrian river designated as SSSI. This includes the Derwent and Cocker, Eden and Eamont, and Ehen river systems.
- Only 38% of the Region's rivers can be classed as being in a 'semi-natural' condition, as determined by the Agency's River Habitat Survey work in the Region.
- There are 9 internationally recognised and protected wetlands classified as Ramsar sites under the international Ramsar Wetlands Convention.
- The Region has approximately 250 000 Ha of land designated, or about to be designated, as internationally important for conservation under EU Directives. This includes 22 candidate Special Areas for Conservation (SACs) under the EC Habitats Directive (1992); and 10 Special Protection Areas under the Birds Directive (1979).
- There are 3 National Parks. The whole of the Lake District, and parts of the Peak District and Yorkshire Dales National Parks.
- There are 4 Areas of Outstanding Natural Beauty (AONB): the Forest of Bowland, Solway Coast, Arnside and Silverdale, and the North Pennines. These cover approximately 1700 square kilometres in the Region.
- There is a Heritage Coast site at St. Bees Head in Cumbria.
- Hadrians Wall in Cumbria is a World Heritage Site
- It includes parts of the North Peak and South West Peak and the whole of the Lake District Environmentally Sensitive Areas (ESAs).
- It contains two Community Forests: the Mersey Community Forest and the Red Rose Community Forest.
- There are over 1000 Scheduled Ancient Monuments (SAMs).
- The Region is important for the following internationally important species and habitats covered by the EC Habitats Directive:

(i) Habitats — Dystrophic, oligotrophic, and mesotrophic lakes, rivers with water crowfoot vegetation, coastal dunes, estuaries, transition mires and quaking bogs, large coastal bays, mudflats and sandflats, raised bog, blanket bog, coastal shingle vegetation, coastal marshes, and hard water springs.

(ii) Species — Yellow marsh saxifrage, narrow-mouthed whorl snail, otter, freshwater crayfish, allis shad, twaite shad, salmon, river, brook and sea lamprey, bullhead, and great crested newt.

- The Region contains important resources of the following priority habitats and species listed under the UK Biodiversity Action Plan for which the Environment Agency has special responsibilities:

(i) Habitats — Reedbed, coastal and floodplain grazing marsh, mesotrophic lakes.

(ii) Species — Water vole, Otter, Bittern, Sand lizard, Allis and Twaite shads, Vendace, Netted carpet moth, Sandbowl snail, Medicinal leach, Freshwater pearl mussel, Depressed river mussel, Slender naiad, Yellow marsh saxifrage, Natterjack toad, Marsh fritillary, Freshwater crayfish, Harbour porpoise, Great crested newt, Petalwort, River jelly lichen and Floating Water Plantain.

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

ENVIRONMENT AGENCY GENERAL ENQUIRY LINE
0645 333 111

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

ENVIRONMENT AGENCY EMERGENCY HOTLINE
0800 80 70 60

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