

EA-NORTH WEST

North West



Conservation, Biology and Recreation
annual report 1999-2000



ENVIRONMENT
AGENCY

Front Cover

Environment Agency ecologist Helen Hamilton begins planting alongside the River Alt with pupils from Croxteth Community Comprehensive School.
(Environment Agency, April 1999)

CONSERVATION, BIOLOGY AND RECREATION REPORT 1999/2000

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INTRODUCTION

This report provides a brief overview of the work and major issues in the Region over the 1999/2000 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 Environment 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.

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

Following the Rio Earth Summit in 1992, the UK Government launched "Biodiversity: the UK Action Plan" which is a strategy for halting and reversing the declines experienced by a wide range of the most threatened species and habitats.

The North West Region supports a rich and diverse range of habitats and species, and the Region's extensive upland areas, coasts, estuaries, Meres and Mosses are of great national and international value for wildlife. The Agency is responsible for a wide range of actions for species and habitats in the NW and continues to work towards these actions through routine operations and specific project work.

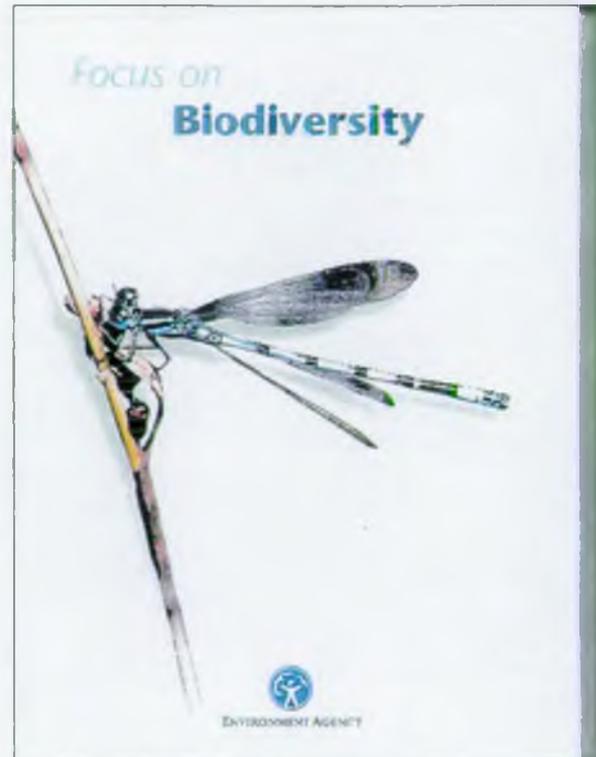
This report describes a range of biodiversity actions including those for pearl mussel, vendace, natterjack toad, medicinal leech, watervole and otter. Action is also focused upon key wetland habitats such as fens, reedbeds, wet grassland and mesotrophic lakes.

Many staff in the North West Region are Agency co-ordinators for particular species or habitats and have provided a regional and in some cases national focus for action to further the conservation of key species or habitats. Where the Agency is the National Lead Partner, progress has also been reported to the Joint Nature Conservation Committee at the request of the DETR for a Millennium Report against the UK Biodiversity Action Plan..

During the past year ecologists have continued to be heavily involved in the production of Local Biodiversity Action Plans, particularly for Cumbria, Cheshire, North Merseyside and more recently Lancashire, Greater Manchester, Mersey Forrest, and Wirral. Plans are at different stages and have required Agency input to supply information and in some instances produce the text for draft action plans where the Agency has specific expertise, such as rivers. Thus a key part is played in plan development focusing upon the delivery

of national and regional priority actions within a local context.

To mark five years of biodiversity work, the Agency has produced 'Focus on Biodiversity' detailing the full extent of the Agency's work for biodiversity.



At a Regional level the agency is a member of the North West Biodiversity Forum. Following on from the success of 'Wild About The North West: A Biodiversity Audit of NW England' in 1999 the group is looking at how best to review and update the audit so it can be used well into the future.

The North West Audit presents information and distribution of species and habitats so that organisations responsible for land management and planning can identify species and habitats that need to be considered and who is responsible for this.

The Agency is also a member of the Forum subgroup assessing how to look at changes in biodiversity over time by the use of Biodiversity Indicators, Targets and Measures to assess progress in the region on achieving

practical benefits for threatened or declining species and habitats.

Sustainable development is at the centre of the Agency's remit and biodiversity is a key test of sustainability. This is linked with the major environmental priorities in the region to maintain and improve the quality of its natural environment and biodiversity for the enjoyment of future generations. A high quality natural environment is essential to the region and is an economic asset through tourism and leisure significance.

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.

A Regional Habitat Directive Co-ordinator is now in post and a regional project plan has been established to deliver the Habitats Directive in the NW. Multifunctional teams have been set up in each Area to deliver the review of consents which has to be complete by 2004.

New applications for permissions continue to come forward within or adjacent to SACs and SPAs and have to be carefully assessed by Ecology staff.

At a meeting in Kilkee in 1999, the EC decided that the UK had to designate more sites under the Habitats Directive. The results of the 'Kilkee Moderation' are to be published in 2000 and this is expected to significantly increase the number of SACs in the NW and also modify the sites already designated. This will increase the workload associated to the Habitats Directive for Ecology and other functions within the Agency.

WATER LEVEL MANAGEMENT PLANS

Water Level Management Plans (WLMPs) provide a means by which the water level requirements for a range of activities in a particular area, including agriculture, flood

defence and conservation can be balanced and integrated. The North West has 29 WLMPs where the Agency is the main operating authority and therefore has to prepare the plans. All water level management plans at sites designated under the Habitat Directive were completed by the deadline of March 2000 and progress is well underway to achieve SSSI sites by December 2000. All other sites have to be complete by March 2001.

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

General Quality Assessment

The year 2000 is GQA year for Biology, an event which happens every five years.

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).

Much preparation took place prior to this, in the form of workshops to ensure that a consistent methodology could be applied and checking of site details so that comparisons could ultimately be made with information collected in 1995.

NATIONAL MARINE MONITORING PROGRAMME

Biological samples have been collected from Morecambe Bay, St Bees Head, Ribble Estuary, Mersey Estuary and Liverpool Bay as part of a national sampling programme 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.

PARTNERSHIPS

Partnerships with external organisations continue to provide successful projects on the ground. Combining resources and aims for particular projects can achieve more environmental benefit. Examples are highlighted throughout this report and range through a variety of issues from biodiversity monitoring to tackling Alder root disease.

SUSTAINABLE RIVER MANAGEMENT PROJECT

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.

The project continues successfully into its third year with many Stewardship agreements being targeted on the Weaver in Cheshire and the Ellen and Ehen in Cumbria.

For three years, monitoring has been carried out on 2 stretches of river where stock were fenced off from the river bank. The monitoring included :

- physical measurements of the river bank to assess the rate at which erosion occurred with or without fencing,
- physical measurements of the river channel to assess the change taking place if erosion was reduced by fencing
- botanical surveys of the river banks to assess the type of vegetation recovery of the river banks

The monitoring has now been completed by APEM and the results are to be published over the next year.

RECREATION

This year has seen significant activity in the region to deliver the Agency's principal aim for recreation, which is to protect, improve and promote recreation on or near water. The development of regional guidance on recreation input to Local Environment Agency Plans (LEAPs) is leading to consistent issues and input to these important planning documents that greatly assist in delivering our aims.

A key factor for the Recreation in the Agency is working with and influencing others. This is essential, as we do not have large amounts of land where we can create recreational facilities. This year we have made comment on the development of five Local Authority Unitary Development Plans, as well as many local planning applications. This together, with input to the North West Development Agency's Strategy, is an example of how we can influence others by putting forward our recommendations for recreation.

We have worked with others, through the many projects set out in this document, and through representation on groups such as, the Furness Greenways Partnership and the

Mersey Basin Campaign River Valley Initiatives. We have also worked with other national bodies to help them achieve their aims. One example of this is on the Wirral where Sustrans are trying to put part of the Millennium Cycle route in place next to a watercourse and we have given advice on what would be appropriate, and support for the project. Also, a seminar was held with the British Canoe Union (BCU) at the Burrs Activity Centre, in October, where we were represented by staff from each of the three areas and gave various presentations. There was also discussion on where access might be achieved and the best way forward, and the BCU gave examples of sites where improvements had been made.

Further joint working is looking to produce a leaflet with British Waterways on the wider recreational opportunities associated with watercourses that are navigated. We are also working with Rochdale Metropolitan Borough Council who have been awarded some European funding, some of which will be used to improve the environment and recreational value of a section of the River Roch.

The first ever comprehensive guide to recreational opportunities in the Mersey Estuary area was published in June. 'Making the most of the Mersey' was an Agency led initiative in partnership with the Mersey Strategy. It brings to the public the wealth of recreational opportunities in the area and the environmental improvements that are taking place in a bold imaginative way. The guide will be widely distributed.



City waterfront

KEY TO SYMBOLS

- | | | |
|----------------|--------------------|----------------------|
| Museum/gallery | Walking | Gardens |
| Theatre | Cycling | Miniature railway |
| Cafes/bars | Fishing | Metropolitan station |
| Ships | Country park | Car park |
| Sports venue | Watergates/raiding | Low tide area |
| Viewpoint | Golf course | Parks/recreation |



Example of map showing recreational facilities

REGIONAL LANDSCAPE AND HERITAGE OVERVIEW

The work of our Regional Landscape Architect has concentrated on our flood defence capital schemes with inputs into the design of the Roch scheme in Rochdale, Walton le Dale in Preston, Pendle Water in Nelson, Irwell in Salford, the Cocker in Cockermouth, Blackbrook Chapel-en-le-Frith, the Mersey in South Manchester, the Gowy near Ellesmere Port, Cockersands Sea defences, Lower Lancaster Sea Defences and others.

The Agency has been busy preparing for the Millennium Festivals that were held in each area. Some of the festivals included on the ground improvements to the environment:

- In South Area at Landlife's National Wildflower Centre a Sensory garden has been designed and will be built soon.
- In Central Area at Padiham a surfaced path by the river Calder was provided along with wildflower planting.
- In North Area a Sensory Trail is being planned at the Lake District Centre at Brockhole near Windermere.

There has been a variety of other improvement projects where the landscape architect has been involved. This has included a 5-hectare woodland planting scheme at our Tue Brook project and a design for a major canoe and fish pass at a weir on the River Calder near Padiham. A landscape scheme was also implemented around the car park at our Central Area Office.

With regard to conserving our cultural heritage the main issue is that no one really knows what is of value adjacent to our rivers and streams. We have therefore commissioned some surveys. The second of these, which we carried out this year, was in the Croal Irwell catchment and this revealed some interesting comparisons with the adjacent Roch catchment which we surveyed last year. (See the main article)

Environmental Impact Assessment

We are currently in the process of appointing a Regional Environmental Impact Assessment Co-ordinator. When in post she will be involved with devising national policy and implementing this within the North West. The overall aim of the Agency is carry out some form of environmental assessment of all our works that make a physical impact on the ground. This new post will be crucial in the implementation of this objective.

Archaeological Surveys in North Manchester

Rivers have been important features in the development of England. The Vikings and Romans have used them as transport routes, they provided much of the early power in the industrial revolution, and have always been important as a water supply as well as a waste disposal system. They have had effects by restricting over land movements to places where they can be bridged and sometimes bursting their banks and flooding land. All these different aspects of rivers have left a legacy of riverine archaeology.

As well as conserving wildlife the Agency has a duty to consider the protection of our built heritage. Unfortunately, apart from nationally important sites, we do not know very much about our river's archaeology. We therefore commissioned some surveys to find out what archaeology was present within our rivers.

We looked at two catchments in north Manchester; the Roch, Irk, Medlock and the Croal Irwell. These catchments are one of the birthplaces of the Industrial Revolution. A methodology was devised where we planned to look at a corridor 10 metres wide on either side of the all the Main Rivers in the area. Lancaster University carried out both surveys over two years.

The survey revealed just how little we, or anybody else, knew about the archaeology of our rivers in this area. The number of known archaeological sites was increased by 379% in the Roch, Irk and Medlock catchments. 96% of these sites were from the Industrial Age. An interesting feature was that in the Croal

Irwell catchment, which is adjacent to the Roch, only 65% of the sites were industrial sites. This is surprising for what might seem similar catchments. The reason is probably because the upper Irwell is less well developed and so more earlier features survive, while lower down there has been a lot of demolition and landscaping of the industrial landscape.



Artefact from the Cronl Irwell survey

There are also interesting differences in the type of industrial development. Both areas were based on the textile industry. However, the Roch had far more mills spinning and weaving woollen and later cotton based textiles, while the mills in the Irwell Valley were mainly concerned with the finishing of the textiles by dyeing or bleaching. There was a lot of other industry in the area but much of it was directly related to the textile industry. There were paper mills that used the rags from the textile industry as raw material. There were also chemical works producing chemicals for the finishing of the textiles and there was also heavy mechanical industry making and repairing the machinery used in the mills. One can also follow the movement of industry from the small water powered mills high in the catchment down the valley as coal powered steam energy took hold. The rivers were still important, however, as a source of water and disposal of waste.

All the different sites identified are now on an Access database that is on the Agency network and incorporated on the Agency's GIS system. We can now carry out our works and give consents with a good knowledge of the archaeological resource present at a site. We have plans to continue the survey in other catchments.

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HABITATS DIRECTIVE

European Marine Sites

Area staff continue to contribute to the development of a scheme of management for Morecambe Bay, Solway Firth and Drigg Coast candidate SACs. Such schemes will set the framework within which activities will be managed, either voluntarily or through regulation, so as to achieve the conservation objectives for these European Marine Sites.

The Agency is represented on the relevant authority management groups for these sites and the main task this year was contributing to the production of the Regulation 33 Advice packages for the above sites.

This advice allows us to understand the international importance of each site, the underlying physical processes and the ecological requirements of the habitats and species involved. It also allows standards to be set against which the sites' interest features can be determined and monitoring undertaken to establish whether they are in favourable condition.

Draft schemes of management that require detailed input from the Agency, are now being developed to ensure that the ecological requirements of the sites' features are met.

The same process will begin for the Duddon Estuary, another European Marine Site, later in 2000.

Habitats Directive Local Implementation Team

Whilst the EU Habitats Directive and the Habitats Regulations which translate the directive into UK law are conservation initiatives they impact on all Agency functions. In recognition of this situation a multifunctional implementation team was established in North Area steered by FER.

The initial task embraced by the team was the review of consents at priority European sites. These sites were identified as the Rivers Ehen, Eden and Derwent cSAC's. The process of appraising existing authorisations has been hampered by the absence of conservation

objectives for the sites and it is anticipated that these will be produced by mid 2000.

In the meantime work on compiling details of relevant authorisations and carrying out an initial appraisal of their likely impact is continuing.

New Works

In 2000, the area will concentrate on the appraisal and assessment of new works and authorisations in existing sites. Newly designated sites arising from the Kilkee moderation process, due to be completed in May, is likely to significantly add to the new authorisation appraisal requirements for North Area. This process will also add to the consents review workload which must be completed by 2004.

BIODIVERSITY

UK Biodiversity Action Plan

Our staff continue to be 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, marsh fritillary and vendace.

Steering group meetings have been attended (North Area hosted the UK steering groups for freshwater pearl mussel and vendace) and draft work programmes to support individual action plans have been produced.

In addition for vendace and freshwater pearl mussel, where the Agency is the National Lead Partner, we were asked by the DETR to report on progress of Action Plan delivery to JNCC. This proved to be quite a significant task, having to obtain and collate a wide range of information from a variety of organisations.

Contributions have also been made to the Agency's Focus on Wildlife Report which details our contribution to the UK Biodiversity

Action Plan, soon to be published in Spring 2000.

Cumbria Biodiversity Action Plan

The Agency is also a key partner in the Cumbria Biodiversity Action Plan. Area staff continue to provide inputs into the steering, technical working and various focus groups associated with the process as well as drafting or co-drafting the vendace, mesotrophic lakes, reedbed and rivers and streams plans.

This first tranche of plans have now been published as a public consultation draft.

The production of tranche 2 plans will kick off in autumn 2000 and given the list of species and habitats involved, the Agency will continue to be heavily involved in their production and delivery.

North of England Wetland Project

The North of England Wetland Project is a partnership between Environment Agency



Example of overview map from Wetland Project Report

(NW and NE regions), English Nature and RSPB to provide a co-ordinated approach to wetland creation and restoration, to help meet BAP targets for the main wetland Habitat Action Plans. The project aims to provide a comprehensive list of potential wetland sites in the North of England. Each site is assessed using three levels of criteria and progress or not to the next level depending on fulfilment of these criteria.

The end product is a list of sites suitable for wetland restoration or creation with detailed description of the top 20 sites including location plans. Each of the level three potential sites will have brief descriptions of: existing and target habitats, major constraints, basic hydrology and water quality on site, nature conservation constraints and opportunities, owner/occupier attitude (if known), access etc. It is hoped that these sites will be priorities as and when funding becomes available, either locally or through national Heritage Lottery Funding bids.

Results

Catchment	River	No of live mussels
Eden	Eden	1
	Lowther	0
	Swindale Beck	1
Kent	Kent	0
	Mint	0
	Gowan	0
	Dubbs Beck	1823
Leven	Brathay	31
	Leven	0
Derwent	Derwent	0
	Chapel Beck	0
West Coast Rivers	Duddon	0
	Annas	0
	Esk	0
	Mite	0
	Bleng	0
	Calder	0
	Ehen (d/s Egremont)	0

Based on the results of this survey, only two of the rivers support mussel populations that require conservation, namely Dubbs Beck and the River Brathay.

Significantly the presence of juveniles less than 5 years old in the Dubbs Beck population is only the second site in England and Wales showing active recruitment and this has led to

Cumbria Freshwater Pearl Mussel Survey

The largest population of the freshwater pearl mussel in England lives in the River Ehen, Cumbria, which has resulted in it being designated as a candidate Special Area of Conservation (cSAC). Prior to the current survey, the only rivers other than the Ehen with confirmed surviving populations were the Irt and Dubbs Beck, both of which were last surveyed in 1995.

A collaborative project with English Nature and the National Museum of Wales has carried out a wide-ranging survey on virtually all of the rivers with historical data and also those from which there were relatively recent records.

it being currently notified as a cSAC.

Though the Brathay population is small in numbers and restricted in extent, there has been recruitment in the last 10 – 15 years. The habitat conditions are ideal and the

water chemistry components are well below critical limits. Once we have further information on the population size, we can

develop programmes for monitoring and possible species recovery.

South Cumbria Otter Survey.

The Otters and Rivers Project 1991-94 concluded that even the best rivers in South Cumbria were found to have low or transient otter populations. During the years following this project, evidence suggested that the situation was improving, with increasing road casualties and reported sightings confirming the presence of otters in many localities.

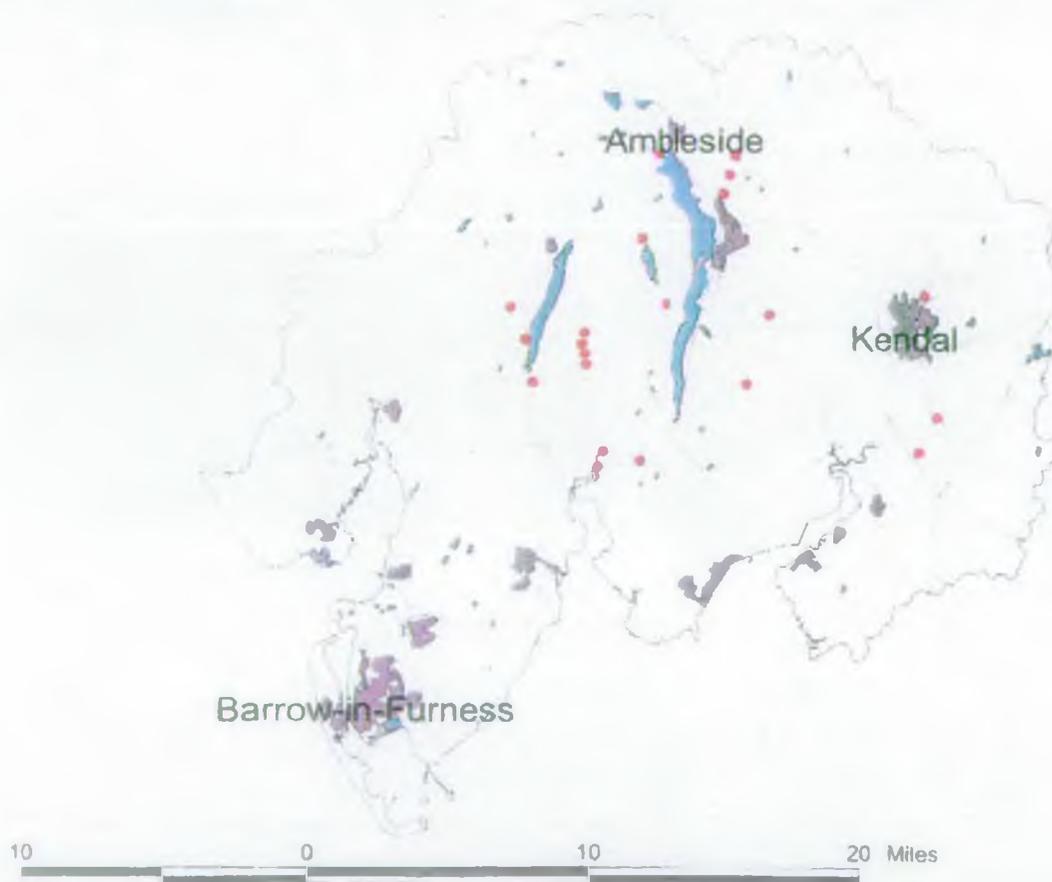
In May 1999, as part of the survey programme, 217 bridges in the south Cumbria LEAP area were visited in a single day in order to check for signs of otter activity. Assessment of the quality of otter habitat in the immediate area was also carried out (bridge abutments are favoured sprainting sites).

Of 167 potentially suitable sites, 21 had evidence of otters (see survey map). The main region of activity appeared to be in the centre

of the LEAP area within the R. Leven and Crake catchments and this fact combined with historical survey work would suggest a fairly continuous otter presence in this part of the county. Otter activity was also evident in the eastern part of this LEAP area in the R. Kent, Bela, Gilpin and Winster catchments. It is encouraging that the animals are so widely distributed across this area, especially in the central Lake District from where they appear to be spreading in to the more upland areas (most likely in response to increasing population densities).

As with last years West Cumbria Survey however, there appears to be few signs of otters in south-west Cumbria, though this may in part be due to the limitations of the methodology. The fact that there is so much potentially good otter habitat in this part of the county may mean that it is only a matter of time before subsequent surveys are reporting the spread of animals into these areas.

A similar survey is to be carried out on the Eden and Solway catchments in May 2000.



Distribution of otter in South Cumbria

Otter casualties

A total of four otter casualties were reported to and collected by the Agency, North Area, during the year. All corpses were sent to Adeline Bradshaw at Cardiff University for post mortem, two were confirmed road casualties, 1 killed by a dog and 1 reported as natural causes. A further three road casualties were reported at a single site near the River Eden. This site is now being considered by the Otters and Rivers Project Officer for fencing to prevent further deaths at this accident black spot.



Otter killed by a dog found at Etterby, River Eden

We will continue to act as a focal point for the collection and processing of otter corpses in Cumbria in line with our national contract.

Spring salmon study on the Eden

The main aim of the study was to identify the spawning grounds of spring-run salmon and to determine whether or not there is potential for the mixing, during spawning, of these fish and later-running salmon.

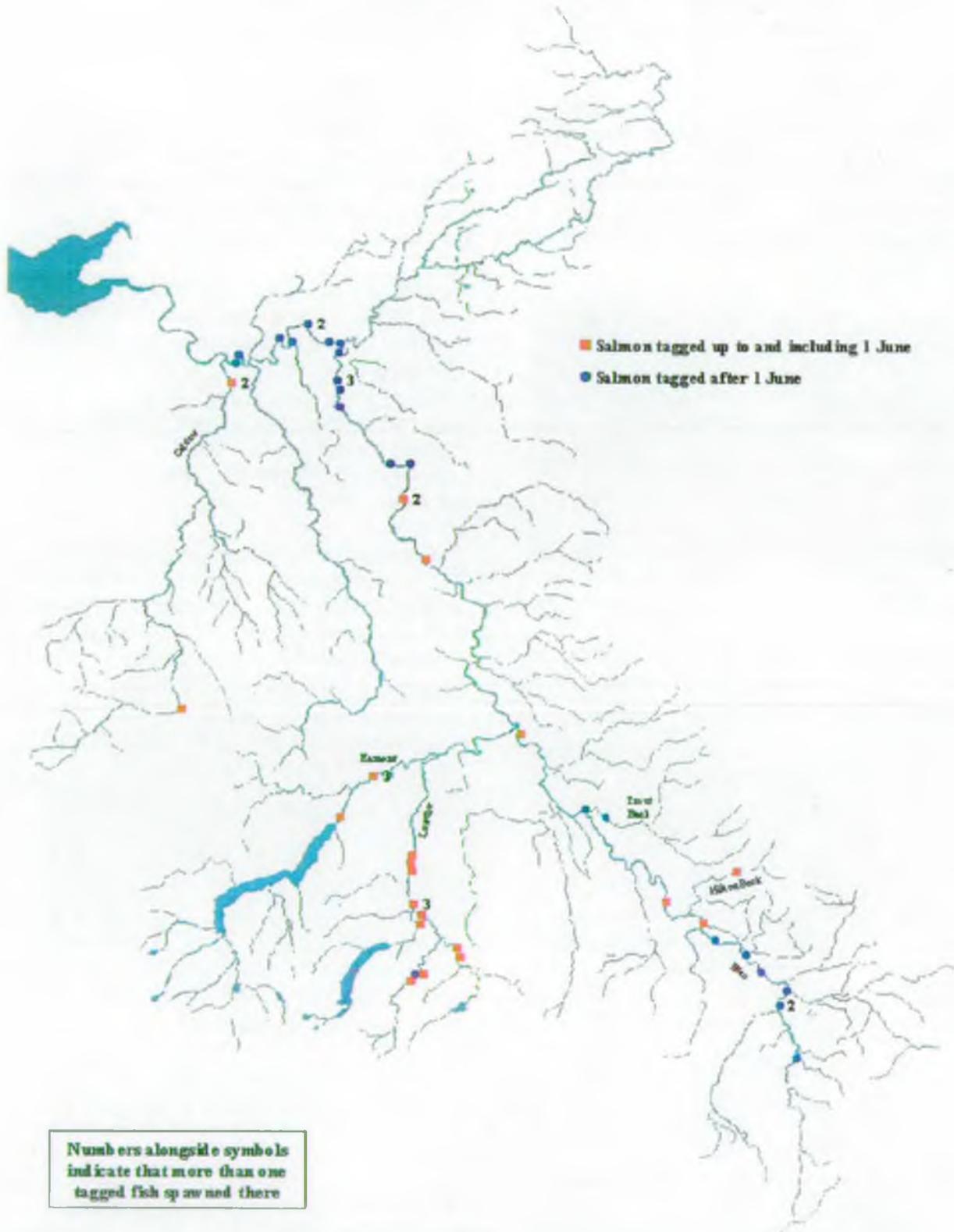
Atlantic Salmon are a feature of European importance within the River Eden cSAC. This study will provide invaluable information into the management of the species within the catchment.

A total of 106 salmon were tagged, the fish were captured by rod and line, fish traps and haaf nets, the fish were then tracked to their spawning location.

The results from the project suggest that the Eamont catchment and the River Lowther in particular are important spawning areas for spring salmon.

The project is collaborative project between MAFF, Environment Agency, English Nature Species Recovery Programme, Atlantic Salmon Trust, Eden Rivers Trust, Eden Owners Association, Eden and District Fisheries Association, Carlisle Angling Association and Solway Rural Initiative. Capture locations and spawning locations are shown on the map next page

Estimated Spawning Locations of Radio-tagged salmon in the River Eden, 1999



The Sustainable Rivers Project on the River Ellen, Cumbria

To monitor the effects of more sustainable land-use practices associated with the uptake of the sustainable rivers project on the Ellen, a baseline ecological study has been initiated. The study has included fisheries, macro-invertebrate, RHS and river geomorphological surveys. Electric fishing surveys have recorded good densities of salmonids in the upper reaches of the main river and its tributaries. In addition the biological quality is generally good although some sites are still recovering from a series of pollution incidents involving synthetic pyrethroid sheep dips.

In its current state the intensity of agricultural practices has led to the degradation of habitat quality throughout the catchment. Inadequate fencing has led to a high incidence of poaching and poor bankside vegetation structure. This has contributed to erosion, which has resulted in the deposition of sediment downstream. In the long term it is hoped that the uptake of the scheme will lead to improvements in habitat quality which will ultimately be reflected in the fisheries and biological quality of the River Ellen.



River Ellen, Cumbria

Protecting Charr Stocks in Ennerdale

Concerns about the apparent decline in Ennerdale charr and efforts to improve this situation were reported last year. The replacement of a pipe bridge across the River Liza with box culverts was completed in the summer of 1999 and it is hoped that this will result in better gravel distribution in the traditional charr spawning areas downstream.



New Irish Bridge on the River Liza

A further stocking of approximately 2000 charr fingerlings was carried out in July 1999. In addition, 50 adults, also of Ennerdale stock parentage, were stocked in December 1999.



Release of Arctic Charr into Ennerdale

Cumbria Vendace Translocation Feasibility Study

Only 2 breeding populations of vendace occur in Britain and these are situated in Bassenthwaite Lake and Derwentwater in the Lake District. The Bassenthwaite population is considered to be under considerable threat.

The Agency therefore commissioned IFE to try to identify waters in Cumbria which are suitable as potential translocation sites.

The study failed to identify a site which was considered ideally suitable as all were found to either contain existing rare fish populations or be not ideal for other environmental reasons.

The study recommended that a hatchery be set up to support recruitment of the Bassenthwaite population in the short term and that

discussion between interested parties, investigate the introduction of the species to a water already containing charr. This discussion would also include consideration of other environmental issues at sites considered to have other environmental constraints.

Natterjack Toad Breeding Ponds Remediation, Annaside SSSI

A partnership project was run with English Nature using Flood Defence plant on site for routine maintenance of the adjacent River Annas, February 2000. Annaside is one link in the chain of nationally important natterjack (*Bufo calamita*) colonies on the west coast of Cumbria.

The site comprises a narrow strip of land bounded by the sea on its western margin and the River Annas to the east. The vegetation shows a transition from coastal shingle and sand dunes through to dune grassland and semi-improved grassland further inland

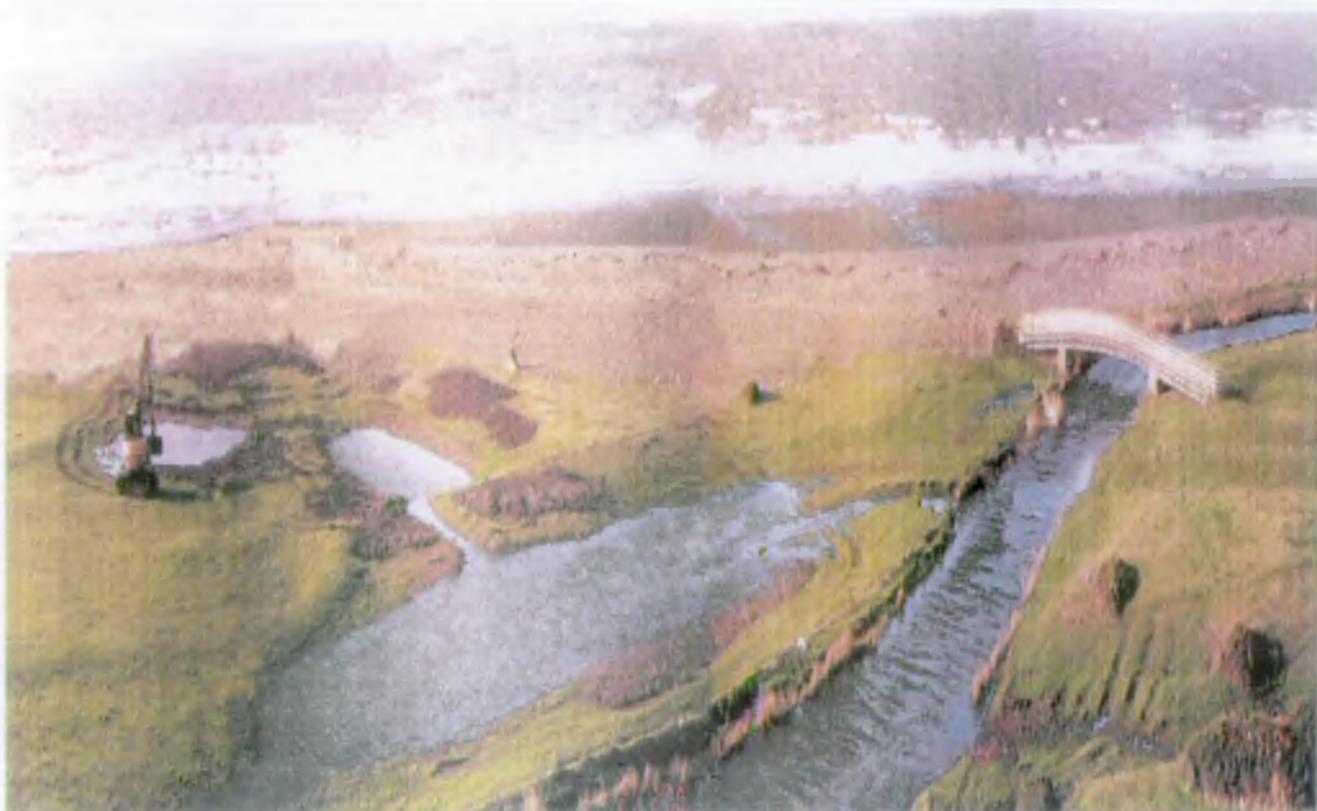
A management agreement already exists between English Nature and the Agency, with specific regard to maintaining acceptable

water levels in the River Annas when clearing tidal gravel accretions from the river mouth at Selker Point.

English Nature have been working with the landowner for some time, to improve the available breeding ponds for Natterjacks and the Agency were able to provide an excavator and supervision to complete the work.

Three ponds were deepened to enable sufficient water to be retained within them for the three months required by Natterjacks to spawn, produce tadpoles and ultimately, toadlets.

It was important to retain the temporary nature of these ponds as over deepening them could create permanent pools, which could then be colonised by other amphibians, potentially out-competing and ultimately displacing the Natterjacks.



Work in progress, Annaside

Cumbria Medicinal Leech Survey

The medicinal leech is now considered to be rare and endangered throughout Europe and by 1997 there were only 20 known sites in England and Wales including 5 in Cumbria.

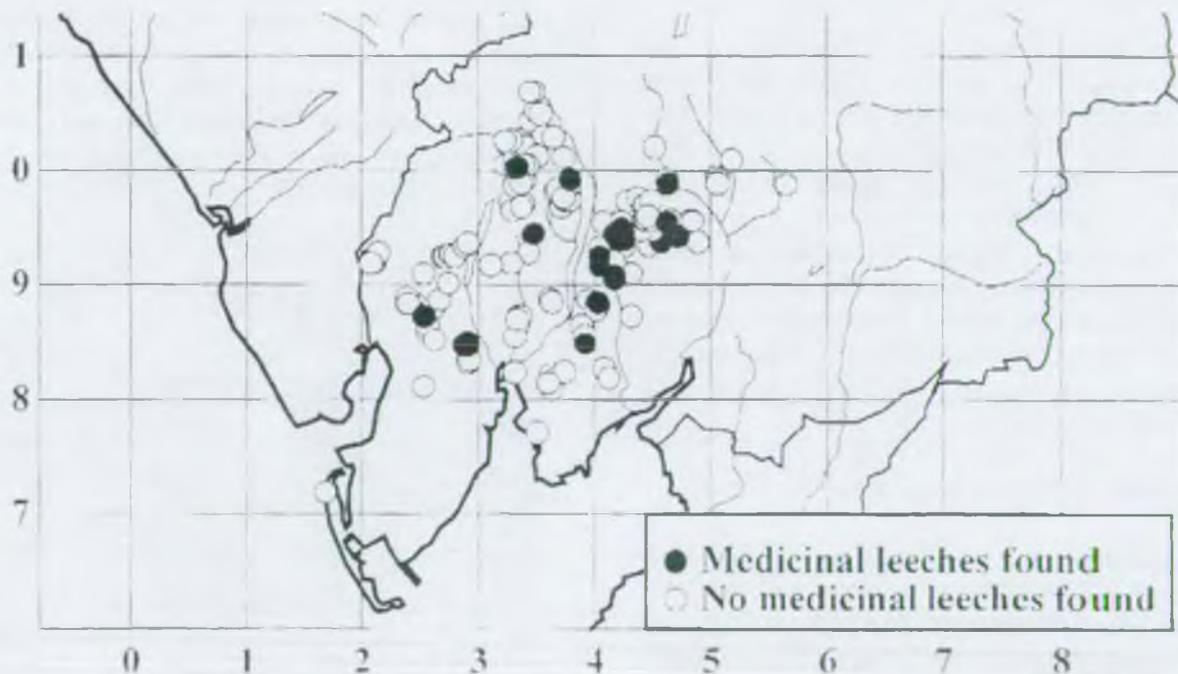
It is a protected species and is identified within the UK Biodiversity Action Plan. In 1998 a systematic survey was started in England and Wales of recorded or likely sites, funded by the species champion Glaxo Wellcome. The

Ireland) and a major stronghold for the species.

Cumbria Great Crested Newt Survey

During 1999 a great crested newt survey was funded by English Nature, Cumbria County Council and the Environment Agency. All existing positive records were surveyed to review the current status of the newt in the County.

The distribution of medicinal leech sites and 1998 and 1999 survey sites



project was co-ordinated by the RSPB as lead partner and in Cumbria was managed by English Nature with additional funding from the Agency, English Nature and the National Trust. The survey centred on south Cumbria where the 5 known medicinal leech sites were located. A total of 168 tarns were surveyed during the summers of 1998 and 1999. Medicinal leeches were confirmed in all 5 of the tarns with recent records, but more importantly also in a further 20.

In the light of survey results in the rest of England and Wales, this makes Cumbria the second most important area in Britain (there are only 2 sites in Scotland and none in

The survey of existing records showed that 65% of known breeding ponds are still being used by the species (52 positive records out of 80 ponds surveyed). In addition 15 new sites were discovered during the year.

The next stage is to provide management advice and assistance to pond owners to ensure continued survival of the species at these locations. Further survey work is also required to provide more objective data regarding the types of ponds great crested newts inhabit in Cumbria.

Lakes Macrophyte Surveys

In collaboration with the Lake District National Park Authority macrophyte surveys were carried out on Esthwaite Water and Derwentwater. The primary interest at Esthwaite Water was to establish the status of the slender naiad. A secondary objective was to evaluate the status of the macrophyte population which could be linked to the trophic status of the lake.

In Derwentwater one of the main reasons for the survey was to establish a comparison with the macrophyte population in Bassenthwaite and thereby aid understanding of vendace issues on both lakes.

A severely restricted distribution of macrophytes was recorded in Esthwaite Water due to dense plankton growths reducing light penetration. It should also be noted that slender naiad was not found during that survey. Derwentwater on the other hand supports a rich aquatic macroflora but there are concerns about the possible future impact which *Crassula helmsii*, a non native species, may have on the lake. Full survey reports are due to be produced early in 2000/1 and will be reported next year.

Sediment Study In Bassenthwaite Lake

As part of a joint venture in conjunction with English Nature the Agency commissioned the Institute of Freshwater Ecology to study the sediment deposits in Bassenthwaite Lake. Components of the study investigated soils in the catchment, sediment in inflowing watercourses, frequently re-suspended material in shallow water and the deep sediment core in the lake.

The primary reason for the investigation is the need to understand the blanketing of vendace spawning areas with sediment and the poor status of the lakes macrophyte population.

The work, which is due to be completed early in 2000, will assist with the consideration of remedial options for the lake.

FLOOD DEFENCE / WATER RESOURCE ISSUES

Works arising from Easter Floods 1998

Two major flood defence/water resource capital schemes have been undertaken during the last year in North Area. A gauging station and weir at Bowston on the River Kent required environmental assessment. The design was altered to ensure minimal impact on the ecology of the river, including minimising the height of the weir, using local stone to clad the gauging hut as well as incorporating an owl box in the roof void.

A major crayfish rescue was required prior to and during construction as the River Kent supports an extremely healthy native crayfish population. A total of 100 adults and 156 juveniles were removed using 'Trappies', hand searching and electro-fishing, all the crayfish were relocated upstream



Completed weir and gauging hut at Bowston, River Kent

A second project is underway on the River Eden at Great Musgrave. This scheme has required environmental assessment and appropriate assessment under the EC Habitats Directive. A number of major issues have been resolved to ensure minimal impact of the weir on Habitat Directive species, e.g. Lamprey, Salmon, Bullhead, Crayfish. The final weir design has been agreed by English Nature and includes three fish pass areas to allow passage of lampreys and bullhead over the weir. The passes have been design to have minimal visual impact and are formed from

large boulders set in concrete immediately downstream of the weir crest.

Water Level Management Plans

Five plans have been completed this year for Duddon Mosses in south Cumbria and Finglandrigg Woods, Bowness Common, Drumburgh Moss and Wedholme Flow all located in the Solway Plain. All five sites contain areas of raised mire and, with the exception of Finglandrigg Woods, the sites are candidate Special Areas of Conservation under the European Habitats Directive. The plans have been agreed between English Nature and the Agency (subject to some minor amendments) and will be published shortly.

A main issue arising from preparation of these plans has been the level of influence that Agency Flood Defence maintenance works has on the sites and the implications of altering the maintenance. No immediate changes are proposed to the current maintenance regimes, although it has been agreed that for the European sites, the plans will be reviewed following publication of the Agency's interpretation of the Habitats Regulations. It has also been agreed that there is a lack of water level data for the sites and that adequate monitoring needs to be established.

Work for the year 2000 – 2001 will involve review of the five plans prepared this year and the preparation of plans for Annaside, Meathop Moss, Nichols Moss and Rusland Valley Mosses.

Cockermouth Flood Alleviation Scheme

Cockermouth lies at the confluence of the River Derwent and River Cocker, both of which form part of the River Derwent & Bassenthwaite Lake cSAC.

The town had significant flooding in the 1930s and 70s, and to address this the Agency designed a flood alleviation scheme to give protection to a standard of a 1:100 year flood event. The scheme involved work within the cSAC, and also within a Conservation Area. It was constructed in 1999 and was the first Agency project of this type or scale on any of North Area's riverine cSACs. This project highlighted the need for Flood Defence and

Ecology to work closely, right through to completion, particularly in sites of such high conservation importance where relatively minor changes to design can be significant.

Crayfish Rescues

North Area staff undertook a number of major crayfish rescues during the year. These were as a result of internal works, mentioned above, external land drainage consents (LDC'S), and emergencies. Rescues for LDC's ranged from localised checks for temporary culverts to one large-scale removal from a beck diversion at Selside where a total of 142 crayfish were re-located.



North area staff rescuing crayfish from Morland Beck

An emergency rescue was carried out during September from Morland Beck where, following un-consented in river works the beck disappeared down a swallow hole. Approximately 1 mile of beck dried out and over 200 crayfish were rescued and re-located.

Joint Management Plans

Multifunctional agreement was reached on routine maintenance operations for 5km of Stainton Beck and Farleton Beck in South Cumbria. This completed the joint management plan for the River Bela catchment with agreement reached for over 11km of routinely maintained watercourses with a significant fisheries interest. The joint management approach involved walkover surveys involving Ecology, Flood Defence and Fisheries staff. Agreements made include re-timing of works to avoid the Salmonid spawning season and the introduction of a

single bank maintenance regime to retain good marginal and bankside cover.

Initial findings show the highest ever sea trout redd count for the Bela catchment, with sea trout redds on Peasey Beck concentrated on the un-maintained right bank. Evidence of otters has also been identified on Stainton Beck.

The next watercourse to benefit from this joint management approach will be the River Gowan on the River Kent catchment.

DEVELOPMENT CONTROL

Oxenholme Road, Kendal

A major new housing development at Oxenholme Road, Kendal has incorporated a Sustainable Urban Drainage system, (SUD's), into its design.

The SUDs pond has been designed to provide flood attenuation, preventing flood flows entering Natland Mill Beck.



SUDs pond immediately after construction

The site drains to a small tributary of Natland Mill Beck which supports a healthy population of native crayfish. The SUDs pond will reduce the impact of flood flows to the crayfish habitat and minimise pollution impact from the site.

Kingmoor Park, Carlisle

A large new industrial estate is being developed on the site of a recently closed RAF maintenance unit base. There are significant issues on this site mainly relating to surface drainage water from the site, but also a

channel diversion to avoid an area of contaminated land. Ecology and Flood Defence staff have taken this opportunity to promote SUDs, which has resulted in 2 balancing ponds and some swales being constructed. We have encouraged better design of the channel diversion to provide a more structurally diverse watercourse than the original field drain it replaces, and are presently involved in discussions regarding the planting/landscaping of this watercourse and the balancing ponds.

WATER QUALITY ISSUES

Urban Waste Water Treatment Directive – Macrophyte Surveys

Twenty-one river sites were subject to standardised macrophyte surveys of 100m reaches, and to epilithic diatom sampling, to monitor nutrient impact from seven major sewage works in the context of Urban Wastewater Treatment Directive sensitive area (eutrophic) designations.

The data on riverine macrophytes has added interest and value in the case of the Eden (Appleby, Penrith and Carlisle sewage works surveyed) and Derwent (Keswick and Cockermouth sewage works surveyed), which both have SSSI and candidate SAC status. The reasons for the Eden SAC candidacy include the quality of its floating vegetation of water crowfoot *Ranunculus* spp, while the Derwent SSSI is especially valued for its aquatic macrophyte communities.



Urban Waste Water Treatment Directive Macrophyte Survey

The Eden site near Temple Sowerby sampled for UWWT Directive purposes was also subject to a more intensive macrophyte and diatom sampling programme as it is a national Environmental Change Network site.

Surveys of descriptive consent sewage works

Ecologists surveyed the plant operation and summarised impact on the receiving watercourse at ninety-five North West Water operated small sewage works with descriptive consents. In a small proportion of cases where problems of apparent non-compliance with consent conditions was noted, the issues were referred back via Environment Protection staff to the operators for action.

Sheep dip pollution monitoring

Further monitoring and investigation of the problems arising from the high toxicity of synthetic pyrethroid (SP) sheep dips to riverine invertebrates was undertaken. Two separate pollution tracing investigations on the Caldew catchment identified definite sources and resulted in successful prosecutions.

Other toxic incidents included a significant invertebrate mortality in Troutbeck (Windermere) and a localised crayfish mortality in a tributary of Morland Beck, though neither of these cases was fully resolved. The frequency of such invertebrate kills consistent with probable SP toxicity was lower than earlier years.

The routine invertebrate catchment monitoring programme again included a number of sites targeted because of potential vulnerability to dip pollution. The routine monitoring results complemented the impression of a reduced impact of dip related problems, with a generally diverse and abundant colonisation of sensitive groups at most clean upland sites, especially in the autumn seasonal samples.



Invertebrate sampling

Herbicides in or near water

Ecologists routinely administer the Agency's regulation of use of herbicides in or near water. In North Area this includes significant involvement with controls on the aerial application of Asulam for moorland bracken management, and the need to protect drinking water sources from contamination.

A limited joint monitoring exercise was undertaken with North West Water in September 1999 to measure the levels of asulam in a river, New Water, draining a treated area, and in an abstracted source. The exercise was properly controlled, with intakes turned off for a period and appropriate buffer zones and other operational restrictions imposed on the helicopter operator. In this instance the objective of protecting water quality was achieved with the Drinking Water Directive regulatory level of 0.1 microgrammes/litre for any pesticide not being exceeded in the abstracted source, or in the watercourse.

Microtox tests

Ecologists have available a Microtox toxicity testing set-up (measuring toxicity in terms of reduced light output from luminescent bacteria) used for rapid screening of the toxicity of environmental water samples or effluents. In a major fish kill investigation on Pow Beck, Whitehaven, some Microtox tests

were performed on stream samples. Detergent pollution involving linear alkyl benzene sulphonates was believed to be responsible for the toxic impact. No published Microtox toxicity data was available for this group of detergents, so original work was undertaken to define the Microtox toxicity of alkylbenzene sulphonic acid.

The tests confirmed that Microtox sensitivity (in terms of EC50) was an order of magnitude less than published short term LC50s for sensitive invertebrates and several orders less than for brown trout exposed to linear alkyl benzene sulphonates. The work showed our various field observations and Microtox test results in the Pow Beck investigation were consistent, and reinforces the need to be extremely cautious in any attempted extrapolation from Microtox toxicity data to toxicity to other groups of organisms.

Special WQ surveys

Where possible, water quality problem areas or issues requiring to be monitored are efficiently absorbed into our work programme by addition of sites within routine catchment surveys using standard invertebrate monitoring methods. However, some problem-orientated surveys are dealt with on an individual project basis, when frequency, intensity of cover or methodology make this preferable.

Such problem-orientated surveys undertaken during this year include:

- using invertebrate and diatom sampling to monitor the impact of the re-sited Great Langdale Sewage Works on the River Brathay
- invertebrate monitoring upstream and downstream, and before and after the inception of a new flocculant treatment at a number of quarry sites with lagoons treating surface water
- undertaking detailed invertebrate surveys on Distington Beck to monitor it's quality and particularly the impact of Lillyhall Industrial estate on it

Reed Bed Workshop

A regional training day at Leighton Moss RSPB reserve was held in October 1999. The day incorporated both constructed and natural

reed beds and looked at issues such as water quality, management and creation opportunities. The afternoon involved a walk round the reserve discussing management and biodiversity. Some staff were even rewarded with a glimpse of the elusive bittern at the close of the day.



Staff attending reedbed workshop at Leighton Moss

Carr Wood, Aspatria

A detailed site survey/investigation has been undertaken at Carr Wood near Aspatria to develop a solution to a long standing water pollution problem. The site is a 40 acre spoil tip from the former Brayton Domain deep coal mine which ceased production in the 1920's.

The site is somewhat unique in that a large natural wetland area adjacent to the site provides a degree of treatment to the polluting run-off. Due to serious erosion of the tip & the strength of the polluting run-off the wetland area is failing & large parts of it have unfortunately died back.

The investigation has looked at options for protecting and enhancing the performance of the wetland whilst at the same time preserving the diverse habitat. The project brief was to investigate a sustainable solution which minimised the need for any significant movement of spoil or other heavy engineering. Funding options are now being investigated to trial the developed solution

PARTNERSHIPS

Cumbria Biological Data Network

The network is a recently formed partnership of organisations including the Agency, Lake District National Park Authority, English Nature, Cumbria County Council, Tullie House Museum and Cumbria Wildlife Trust.

Its aims are to exchange and share biological data and information to enable more effective nature conservation and education to be achieved, to co-ordinate and develop research activity and to stimulate increased species recording. Our participation will ensure we have the best information available to fulfil our statutory conservation duties whilst considering both our own works and third party applications.

Phase 1 Survey Maps of Cumbria

A good example of the data network in practice was the capturing of English Nature's Phase 1 survey into a GIS compatible format. Though now over 10 years old this survey still presents some of the best information as to the location, extent and quality of semi-natural habitats in Cumbria.



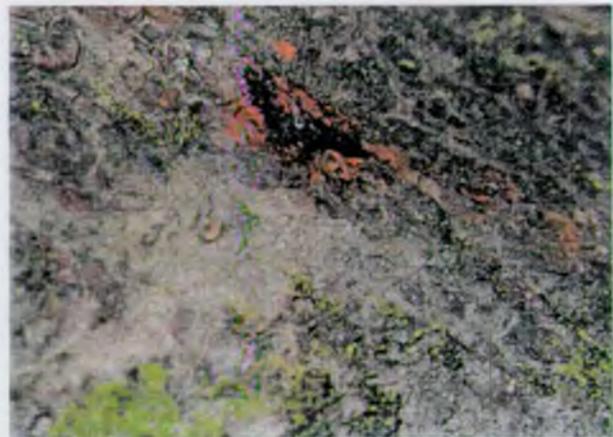
Example of Phase One Habitat Map

We were able to enter into a collaborative project with the Lake District National Park, English Nature and Cumbria County Council. This database provides an excellent tool for screening third party consents.

Alder Root Disease Seminar

A joint Forestry Commission / Environment Agency seminar was held in February at Ghyll Mount to highlight and discuss the issues of Alder Phythphora. A number of new sites in Cumbria have been confirmed during the past year including sites on the River Eamont cSAC, River Kent pSSSI, River Leven and River Ehen.

A list of sites where the disease is present will be held in North Area office and best practice guidelines for reducing the risk of spread will be distributed to all relevant departments.



Example of tarry rust marks often found on Phytophthora diseased alders

PROMOTION

Groups and Events

Agency staff continue to build closer working relationships with other organisations through representation at various groups and events in 1999/2000.

Groups:

- Wildlife Sites Project
- Cumbria FWAG Steering Group
- Solway Firth Partnership
- Morecambe Bay Partnership
- Barrow Countryside Group
- Warcop Conservation Group

Events:

- Training Day for National Trust Managers
- Cumbria Wildlife Trust Millennium Walk
- FWAG River Ellen Farm Walk
- Guided Walk on River Ellen for Dearham Anglers and Parish Council
- NPI Red Alert Red Squirrel Raft Race



Agency Team – doing well until they sank!!!

Talks:

- Carlisle Natural History Society – Flood Defence and Conservation
- Askam Ladies Club – Conservation of Rivers and Lakes
- Watermillock Womens Institute – Conservation and Biology
- Penrith Young Farmers Club – Conservation and Biology

RECREATION

Introduction to Fishing Days

Fisheries staff attended two fishing days for young anglers throughout the County. Several examples included one organised by the Esk and Liddle Improvement Association and provided angling opportunities for young anglers to fish some of the best beats on the Border Esk. Agency staff assisted by the provision of a general licence, and also gave a presentation on the work of fisheries.

Another example was a day organised by Carlisle Angling Association; again Agency staff provided a general licence for the day and gave a presentation to the young anglers.

Fisheries staff also attended a similar day at Esthwaite Water.



Danny Watson with a new found friend
Photo Courtesy of Cumbrian Newspapers Ltd

As part of the annual fisheries seminar run by fisheries, an introductory day for 23 children was organised at New Mills fishery. Throughout the day instruction was given to the children by agency staff and members of local angling clubs, by the end of the day all of the children had managed to catch their first fish

Canoeing

Fisheries staff attended an awareness day run by the British Canoe Union, which highlighted difficulties faced by the BCU whilst negotiating access agreements. Fisheries officers were able to input some of the concerns expressed by anglers and fishery owners regarding canoeing.

Use of Public Fishery on Coniston

The Agency leases the fishing rights to Coniston Water. Anyone may fish this lake free providing the hold a valid Environment Agency fishing licence. Access to the lake requires landowners permission.

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BIODIVERSITY

Bracken Control and Management

Aerial applications of herbicides for bracken control require agreement from the Agency. In Central Area most aerial applications take place in the Forest of Bowland, an area which provides much water for public supply.

Proposals to spray bracken are assessed by Agency staff and, where appropriate, Agency Agreements for the aerial applications are given. Agency staff also advise on ways to control bracken and how to manage land to prevent re-invasion. This work necessitates close liaison with landowners and others. During 1999 the Moorland Association promoted a workshop on bracken control at which Ecology staff spoke about bracken control from an Agency perspective.

On a larger platform, Area staff are on the project board for an Environment Agency Research Project on bracken control.

Lancashire Local Biodiversity Action Plan

The Agency is a key partner in producing the County BAP and Area staff participated at Steering Group level as well as contributing specialist expertise for specific habitats and species. Contributions in the first tranche include the section on rivers and streams and in the second, sections on the White Clawed Crayfish and Freshwater Pearl Mussel will be written.

The Plan will be published during 2000.

Lane Ends Reed Bed creation – Phase II

Lane Ends Amenity Area is an Agency-owned nature conservation and recreation site. The site includes a lake that is managed for nature conservation but which was originally dug (to win material for local sea defences) with steeply sloping sides that have prohibited plant colonisation. In 1998 an initial phase of habitat improvement works were carried out to improve the lake margin. The reed planted in this first phase has become well established, although it has been slow in spreading and

thickening. Further work was carried out in March 2000 to expand the improved margins. The project aims to create a reed-fringed lake, suitable for nesting sedge and reed warbler.

An artificial wet shelf has been built out into the lake using straw bales as the building blocks, held in place with stakes driven into the lake bed, and bound together with loose weave hessian geotextile.



Reed-bed creation works at Lane Ends

Soil spread over this provided a growing medium for the Norfolk Reed (*Phragmites australis*) rhizome planted on top. The lake has coot and swans, so it is important to protect the sprouting shoots from grazing using a combination of plastic tape and hessian sacking. The development of the reed fringe will be monitored, and further works will focus on importing more rhizome to thicken up the sparse planting.

Mammal Training

A training course in mammal identification skills arranged by Central Area was attended by staff from Central Area Ecology, together with colleagues from South Area Ecology, the Lancashire Wildlife Trust and Cuerden Valley Park Trust. The two-day training course was part of the Mammal Society's/Field Studies Council 'Look Out For Mammals' mammal identification skills workshop. Due to the demand, the course was organised 'in-house' with the Mammal Society trainer providing the training. This proved an immensely successful formula, with the training tailored to the Agency's requirements and even involved humane trapping of mammals in a local park and in the Lutra House car park! Bank voles,

field mice and the common shrew were all found in the grounds of Lutra House proving that the pond and adjacent areas do provide a valuable wildlife habitat.

North Merseyside Biodiversity Action Plan

The UK Biodiversity Steering Group Report (following from the UK BAP 1994) highlighted the priority species and habitats at a UK level. The Agency is the national 'contact point' for several species including the water vole, natterjack toad and sand lizard which are all 'UK priority species', and occur in North Merseyside. Consultation has just finished on a total of 14 species action plans (SAPs) and 6 habitat action plans (HAPs) which have been drawn up under the first Tranche of the North Merseyside Biodiversity Action Plan (NMBAP). These are as follows.

HABITATS: wet woodland, lowland heathland, lowland mixed broadleaf woodland, sand dune, lowland basin mire, coastal saltmarsh.

SPECIES: bats, red squirrel, sand lizard, skylark, song thrush, water vole, brown hare, dune helleborine, early sand-grass, grey partridge, Isle of Man cabbage, natterjack toad, petalwort, purple rampion-fumitory.

The second tranche of action plans will be drawn up by December 2000, and consulted upon in spring 2001. Both tranches of action plans will be launched at the North Merseyside BAP Launch which is planned to take place in early summer 2001.

The proposed tranche 2 list is as follows.
HABITATS: arable land, field boundaries, vegetated shingle, estuaries, maritime cliffs, canals, ponds, urban trees, urban parks, urban grasslands, two woodland habitats (not completed in time for tranche 1).

Species: marine mammals, seabirds, lapwing, turtle dove, spotted flycatcher, stonechat, willow tit, tree sparrow, house sparrow, bullfinch, redpoll, reed bunting, corn bunting, common lizard, great crested newt, *Laccophilus ponticus*, heath tiger beetle, sword-grass moth, sandhill rustic, *Colletes*

cunicularius, ruddy darter, red-eyed damselfly, dark green fritillary, grayling, common blue butterfly, bird's-foot trefoil, bluebell, grey hair grass, smooth rupturewort, sharp club-rush, Baltic rush + hybrids, willow hybrids, dune bryums, lesser bearded stonewort, *Tortula freibergii*.

Otter Casualty

Post mortem results were received for a dead otter found within the River Lune area. The results revealed that although the otter was found some distance away from a road, the injuries sustained suggest severe trauma. It is suspected the animal was involved in a road traffic accident and travelled a short distance before death. The animal was in good health and was in the latter stages of pregnancy with a male cub.

River Ribble River Habitat Survey

The River Ribble flows through a predominately agricultural catchment, with great value for fisheries, recreation and conservation. This project aimed to collect and analyse River Habitat Survey (RHS) data to produce a natural assets register which can then be used to plan and direct habitat improvement works, ensuring an holistic and comprehensive approach.

The main river, and eight tributaries, were divided into 500m long sections. Of these sections, 25% were randomly selected for a full RHS and the remaining were surveyed with a modified "inter-reach" survey. The inter-reach survey consisted of a geomorphological survey looking at depositional and erosion features; and an amended RHS form recording land use, artificial features, and features of special interest. Grazing pressure, bankside fencing, human access, and indications of animals and pollution were also noted.

These data were compared with the RHS reference site network to assess the characteristics of the river on a national context. Results showed that high levels of fine sediments were entering the system, with much of the erosion exacerbated by stock

damage. There were good habitats present for salmonids and sandmartins throughout the catchment and suitable otter and water vole habitat at discrete locations. The invasive Himalayan Balsam was widespread throughout the catchment.

These results can now be used to gain a better understanding of the active processes along the whole of the river, enabling informed decision-making regarding river management. It will also facilitate planned, comprehensive habitat improvement works.

Water Vole Survey

The reduction in numbers of water voles over the last few years has led to important changes in legislation and designation for these mammals. Central Area, in conjunction with Lancashire Wildlife Trust, have developed a survey programme to include all watercourses within Central Area (covering Merseyside and Lancashire).



Water Vole

The 1999 survey focussed on the Alt catchment near Liverpool due to the suspicion that it was still a 'hot spot' for water voles. These suspicions have proved correct with 49% of sites surveyed showing signs of vole activity – this is way above the national average of 11% and the regional average of 4% (Vincent Wildlife Trust National Survey 1996-1998 Preliminary Report).

For 2000, part of the new Lancashire Wildlife Trust Merseyside Conservation Assistant post (part funded by the Agency) is dedicated to co-ordinating and promoting the survey and surveys on the Crossens and Douglas catchments will be undertaken. The surveys involve using local conservation groups, universities and other volunteers. Anyone undertaking a survey is trained to a set survey methodology. By using local groups and volunteers we hope to encourage future monitoring of water vole populations on a local level whilst also raising the profile of the water voles plight.

West Lancashire Barn Owl Boxes

The disappearance of barn owls from the countryside across Britain and Ireland has been attributed to a number of causes, one of which is the loss of nesting sites due to the collapse or conversion of old farm buildings, and decline in numbers of old trees.

The rough grassland of pumped drainage systems provides good habitat for small mammals and therefore a rich source of prey for barn owls, away from the dangers of traffic. The drains and fields of West Lancashire, incorporating the Crossens catchment and parts of the Rivers Alt and Douglas, support a growing population of barn owls. This population expansion could be further assisted by the provision of more nest boxes.

The Environment Agency has a number of secure pumping stations and depot buildings which could house nest boxes for barn owls and other birds of prey. Potential sites were identified with Flood Defence and the local Owl Group. Agency funding provided money for nest box construction. So far one barn owl box has been installed and installation of further 3 barn owl boxes, 2 kestrel boxes, 1 tawny owl chimney box and 3 little owl boxes are planned.

The Owl Group will monitor boxes annually, and any young birds will be ringed. If the barn owl boxes get colonised, the Environment Agency will require a Schedule 1 permit to enter its premises from English Nature.



Joe Crone (EA) and John Price (Owl Group) install a barn owl nest box in the old pumping station building at Clay Brow.

Yorkshire Dales National Park Local Biodiversity Action Plan

Area staff provided specialist input to the Plan, which will be launched in summer 2000

DEVELOPMENT CONTROL ISSUES

Simonswood Brook Wetland, development, Merseyside

Maunder-Westbury Homes wished to develop a green-field site in Melling. The Planning Authority, at the request of Environment Agency Development Control Officer Dave Wilcox, applied a condition to the consent such that surface water runoff should be attenuated to existing rates. On the back of this EA-led planning condition, a 2000 square metre reedbed was created adjacent to Simonswood Brook.



The new wetland adjacent to Simonswood Brook, prior to planting, Jan 2000.

The wetland was designed with both surface water attenuation and wildlife habitat creation in mind, and was incorporated into the public open space. Low-profile surface water outfalls were installed, and the wetland planting scheme was based upon Local River corridor survey information. Future maintenance will be included in routine Flood Defence maintenance of Simonswood Brook.

The alternative arrangement of over-sized sewers and underground tanks would have cost the developer a "minimum of £200k" and would have had no conservation benefit at all.

FLOOD DEFENCE ISSUES

Brock Mill Picnic Site planting and footpath improvements

Bankside erosion on the steeply sided wooded valley of the River Brock has been a longstanding problem, threatening the riverside footpath between the picnic area and the old ruined Brock Mill. This popular and heavily used footpath additionally suffers from pedestrian erosion, particularly 'desire lines' to gain access from the established footpath to the river, causing further erosion to the bankface. The Agency, working with Wyre Borough Council who manage the site, purchased £600 of native tree and shrub species which were used to stabilise the bank face and block desire lines to prevent further erosion by both river and pedestrians.

Floating Pennywort Hydrocotyle ranunculoides

This plant is a native of North America, but is common in Central and South America and also occurs in Western Australia and the Netherlands. It has entered Britain through the aquarist trade and is sometimes sold in garden centres as a pond plant. The sale of this and other invasive plants through such outlets remains perfectly legal and is a national issue.

Floating Pennywort roots at the edge of pools and slow-flowing rivers, and grows out into the water forming a dense mass which can clog the whole pool. Its growth rate is phenomenal, reaching a maximum of 25 cm per day at peak times (Aug-Sept). The plant is quite brittle and bits can break off and float away to start new colonies.



Floating Pennywort

Central Area Ecology and the Agency Press Office mounted a publicity campaign to raise awareness after first finding the plant in the area. This produced a number of reports, where we either sprayed or gave advice on how to eradicate it.

Lower Lancaster Flood Alleviation Scheme

Staff in Central Area have been preparing the Preliminary Environmental Assessment for the Lower Lancaster Flood Alleviation Scheme. The scheme is located on the left bank of the River Lune downstream of Carlisle Railway Bridge and to the west of Lancaster City Centre. Any proposed works would provide increased flood protection to a mixture of residential and industrial properties as well as

reducing the risk of flooding to adjacent roads and footpaths.

There have been a number of significant tidal storm events during this century within this area. Events in 1907, 1927, 1977, 1983, 1990 and more recently 1997 have resulted in flooding to residential property, industrial units, roads and agricultural land. Existing defences give a standard of protection varying from 1 in 5 year to 1 in 50 year level of service. The aim of the scheme is to raise the standard of flood protection to properties within the study area. Historically, the likelihood of flooding from the River Lune is greatest when high tides have coincided with gale force winds. Heavy rainfall within the Lune catchment during the tidal event will further raise water levels and hence increase the risk of flooding.

The site is adjacent to the Lune Estuary Site of Special Scientific Interest (SSSI), which is included within the Morecambe Bay Ramsar Site, Special Protection Area (SPA) and candidate Special Area of Conservation (SAC). This multi-designated site runs along the embankment from Freeman's Wood downstream and extends to Heysham in the north and Fleetwood in the south. Upstream of Freeman's Wood the River Lune is a County Biological Heritage Site (CBHS). Freeman's Wood itself is also a CBHS.

The Preliminary Environmental Assessment will be published and available for consultation in summer/autumn 2000.

HABITATS DIRECTIVE

Area Habitats Directive Group

Recognising that the review of existing consents and consideration of new applications under the EU Habitats Directive will impact on all Agency functions, a multifunctional project team, led by FER was established in Central Area.

Tasked with reviewing consents potentially affecting the Sefton Coast cSAC (a priority European site), the AHDG worked with English Nature to complete draft preliminary

reviews although this process has been hindered by the lack of conservation objectives. In addition the Kilkee moderation may impact on this work. Work is continuing on compiling details of relevant authorisations and carrying out an initial appraisal of their likely impact.

Procedures for considering new authorisations which fall within the Habitats Directive have been developed and work in 2000/1 will centre on implementing these.

Morecambe Bay European Marine Sites

Morecambe Bay overlaps between Central and North Area and staff from both areas have contributed to the development of a scheme of management for this site. This year, work centred on contributing to the production of Regulation 33 advice for Morecambe Bay cSAC. This advice allows us to understand the physical processes and the ecological requirements of the habitats and species involved. It also allows standards to be set against which the sites' interest features can be determined and monitoring undertaken to establish whether they are in favourable condition.

Draft schemes of management that require detailed input from the Agency, are now being developed to ensure that the ecological requirements of the sites' features are met.

MULTIFUNCTIONAL PROJECTS

Mill Brook Park Millennium Green

In 1997, the Millennium Commission awarded £10 million of Lottery money to the Countryside Agency to help fund the cost of creating at least 250 Millennium Greens throughout the UK. Millennium Greens are open spaces for informal recreational use by local people. They are to be held in trust by the local community as a permanent resource for the enjoyment of all.

Mill Brook Park is a large area of public open space with a 'countryside' feel located close to Kirkby town centre. Evidence of people on the site dates back to Saxon times and it is well used today. Kirby Brook runs down the middle

of the park and St Chad's Church overlooks it from the south. The park is designated as a Site of Biological Interest under the Knowsley Unitary Development Plan, for its diverse flora of 115 species including yellow sedge (*Carex lepidocarpa*), glaucous sedge (*Carex flacca*), hairy sedge (*Carex hirta*), ragged robin (*Lychnis flos-cuculi*) and branched bur-reed (*Sparganium erectum*). The site is also home to water voles.

The local community in Kirby chose Mill Brook Park as a suitable Millennium Green site, and the Countryside Agency award was matched by Knowsley MBC. The Environment Agency contributed a further £30k for river improvement works with the objectives of 1) improving the ecological and landscape value of the brook, 2) helping with the development of the Mill Brook Park Millennium Green project, 3) continuing improvements to the watercourses of the Alt catchment, and 4) providing education and publicity opportunities for the Environment Agency.

The river improvement works funded by the Agency include:

- ◆ wet ledge creation at points along Kirkby Brook
- ◆ wetland scrape creation
- ◆ excavation of existing 'oxbow' lakedeepening and clearance of existing pond, on-line with a tributary to Kirkby Brook.



Mill Brook Park Millennium Green: looking down Kirkby Brook toward St Chad's Church with the newly excavated 'oxbow' lake

River Darwen Improvements, Witton Country Park, Blackburn

The final phase of the improvement scheme at Witton Country Park was completed this year. This included an extension of 2km to the original section of path carried out in phase one. The path, which is accessible to all, now runs the full length of the river Darwen where it flows through Witton Country Park and provides good views of the river and our improvements.



River Darwen information board at Butler's Bridge

In addition, the wet ledge created in 1998/9 was stabilised and planted with aquatic marginals. At the same time the 'old meander' area was planted with wetland plants. Both areas have established well.



River Darwen wet ledge on creation, May 1999

A rapid survey of the wildflower meadow, which was seeded in 1998-99 phase, indicated that a meadow flora was becoming established.



River Darwen wetedge four months after planting

The project also involved planting of 1700 native trees and shrubs on each side of the River Darwen and installation of six benches and two information boards.

PARTNERSHIPS

Ribble Estuary Strategy

The Ribble Estuary Strategy is a forum for all those with an interest in the Ribble Estuary – defined as from Formby Point in the south to Rossall Point in the North. It comprises representatives from the County and District Councils, Environment Agency, major industries, Royal Yachting Association, Tidy Britain Group, English Nature and the RSPB. There is also a much more broadly based group, the User Group, which is open to all with an interest in any aspect of the Ribble Estuary.

Its aim is "To sustain, enhance and improve the environment of the Ribble Estuary in order to maximise its potential for wildlife and human use."

The Agency is closely involved with the Strategy and its Project Group. They are currently helping to produce a public information sheet on water quality in the Estuary.

Sustainable Rivers Project

Central Area FER have been liaising closely with FWAG, the Bowland Initiative, landowners, and several habitat groups to continue to improve river bank habitat. Fencing and tree/shrub planting schemes have been carried out on parts of Keld Beck, Leck Beck, Borrow Beck, Cautley Beck, Birk Beck and River Rawthey within the Lune catchment; several sections of the upper River Ribble, Foulscals & Easington Becks within the Hodder catchment, Park Beck and the River Wyre at Scorton, River Yarrow at Ecclestone, River Douglas at Horwich and part of the River Tawd.



Easington Ford October 1999



Cautley Beck June 1999



Cautley Beck February 2000

Future schemes for the forthcoming year include a £30k Leader II project on Cant Beck and fencing/planting on parts of Farleton Beck, Roundthwaite Beck and Smithies Dub within the Lune catchment.

River Valley Initiatives

There are a number of RVIs which are actively being developed within Central Area and the Agency has an active involvement with most of them.

As part of the RVI's Watermark project a number of businesses have enabled access onto land that they own for the purposes of education. As part of this a number of 'teacher training' days have been undertaken in conjunction with REEL (River Enhancement East Lancashire) Gawthorpe Environment Movement. The training days have so far been focussed on two sites - Phillips Components at Altham and Hyndburn Sewage Treatment Works in Great Harwood. Both these sites used were ideal, each having a large amount of company-owned land outside of the main working area of the site and, in the case of Phillips, leased out for grazing.

As part of the training day, groups of teachers were shown around a site and some of the projects and techniques which could be used when taking a group of school children to the site were demonstrated. The teachers were also made aware of available information and resources. One benefit of holding these training days is that much information was given to a large number of teachers, therefore

reaching a large number of schools in a relatively short period of time.

West Lancashire's Wildlife and Landscape Forum (WILF)

WILF arises from Local Agenda 21 and regards the special landscape and wildlife of West Lancashire as being in need of further conservation and enhancement, lying beyond the remit of the Lancashire Biodiversity Action Plan. As a member of the Steering Group, the Agency is helping WILF develop its vision statement and action plans will be produced in the near future.

Wigan Flashes

The Wigan Flashes complex is a system of wetlands and lakes and pools on the edge of Wigan.

The Environment Agency, in partnership with Wigan Council, English Nature, Lancashire Wildlife Trust, Royal Society for the Protection of Birds has formed a Management Group to manage the Flashes to protect and enhance their already considerable wildlife value. A target for the project is to make the habitat suitable to attract Bitterns to breed there, which would make it only the second breeding site outside Norfolk.



Wigan Flashes

The Flashes area is an area of historical wetland, which was then extended and deepened by the collapse of old coal workings. It is now has a diversity of wetlands and areas of open water and is a popular recreation and conservation area.

PROMOTIONAL WORK

Alt 2000 Open Day - July 1999.

As part of the Alt 2000 Open Day, Ecology performed their usual activities outside the display trailer, involving trays of water bugs from the nearby lake and from the River Alt. A good level of interest was shown and a lot of information (especially on garden ponds) given out.

Eco-Schools Assessor

Eco-Schools is a Europe-wide initiative designed to encourage and acknowledge whole-school action for the environment. The initiative is managed in the UK by the Tidy Britain Group and promoted and supported by the Going for Green campaign. Eco-schools is a form of environmental management system for schools, designed to make environmental awareness and action an intrinsic part of the life and ethos of a school for all its pupils.

The Environment Agency is supporting this initiative by training a number of staff as Eco-Schools Assessors who are available to act as 'mentor' to an individual school, or to undertake assessments. An Ecologist within the Central Area Ecology Unit has recently undertaken an Eco-Schools re-assessment of Rochdale Community School, the first secondary school in the country to gain the Eco-Schools Award.

The Robson Meeting

The Robson Meeting is an informal meeting of scientists, engineers and others involved in water management, to discuss aspects related to aquatic weeds and their control. The meeting is held annually, and Environment Agency Regions and other bodies host and subsidise it.

North West Region hosted the meeting held in February 2000, and Central Area Ecology acted as local organiser.

A diverse range of topics were discussed including a special session on Floating Pennywort, following which a national

working group was set up to focus attention and research on this potentially damaging invader.

Lane Ends Amenity Area Open Evening

Lane Ends Amenity Area is an Agency-owned nature conservation and recreation site. For the second year running, a successful summer Open Evening was held here in partnership with the Wyre Borough Council Countryside Service. The aim of the Open Day was to introduce local users to the variety of wildlife that use this site. Bird spotting, invertebrate hunts, pond dipping, bat watching, and a demonstration by the local bird ringing group were all enjoyed by over 30 visitors.

The site is well used by locals for dog walking and general recreation, and the Open Evenings provide an opportunity to highlight the importance of the site to wildlife, and explain some of the (sometimes controversial) management practices.

Royal Lancashire Show Bog Garden

Central Area Ecology staff designed and created a bog garden for the Agency's exhibition stand at the Royal Lancashire Show.



Planting the Bog garden at the Show

The bog garden was planted with native aquatic marginal species with the aim of showing visitors how a wetland can be created to enhance the wildlife value of a garden, without the perceived danger of open water associated with a pond, for families with children or pets. Handouts listing all the plants used to create the garden were available for visitors to take away. In addition, there was a display of invasive alien species often sold in garden centres, to highlight the problems associated with these species spreading from garden ponds into the wider environment. After the show the bog garden was donated to Mayfield School, a school for children with special needs in Chorley, where it was recreated in situ by Ecology staff.

RECREATION

Management of Agency Owned Fisheries

The Agency owns 5 recreation sites in Central Area primarily used for angling, Halton & Skerton (River Lune), Mitton & Balderstone (River Ribble) and The Sluice (Crossens Drains). Development of these sites has been pursued through the initiation of site management plans. Work on the plans has started and will be completed during 2000. Ongoing management of these sites has included river clean-ups, repairs to footpaths and advertisement of the facilities. The Balderstone fishery was leased to Mitre Angler's for 1 year in March 2000 and a new ticket agent was appointed for the Mitton Fishery in October 1999.

Platforms for disabled anglers - The Sluice, Banks

This collaborative project with North West Water, West Lancs District Council and Southport Anglers was completed in March. The project set out to build 4 platforms and associated car park and access to the Sluice at Banks, near Southport. A local Councillor will officially open the platforms in August. The Council provided the land for the car park, NWW paid for some of the material costs and the Agency's Flood Defence Dept designed

and built the platforms. The total cost of the project was 22k.



Platforms for disabled anglers

Canoe Access Agreements

The Agency has been involved in progressing three access agreements on the river Lune, one at the top, middle and bottom. Meetings were held with local landowners and angling interests on stretches of the top and middle sections of the Lune, above and below Sedbergh. The intention was to formulate an agreement which would allow multiple use of the river based on time zoning and agreeing formal ingress and egress sites. Discussions are continuing, however, there are several landowners and angling clubs who have raised objections.

Discussions on an access agreement on the river Calder at Padiham have been initiated. The Agency has plans for a coarse fish pass on the Calder at Padiham weir and intend to

combine a canoe pass with the fish pass. If successful, we believe that this will be the first project of its kind in the country. Designs for the combined pass have been drawn up and formative meetings held with local and national canoe interests. The intention will be to gain an access agreement for a 6km stretch above and below the weir. Discussions with landowners and local public will take place in June.

In addition, an initial site meeting was held with the BCU to discuss proposals for an access agreement on the river Darwen at Whitton. Whilst it was agreed that this project was feasible, it was decided to put the project on hold until after the Padiham weir project was delivered.

Bowland Tourism Environment Fund

The Agency has funded a collaborative project with four Local Borough Councils and Lancashire Wildlife Trust to initiate a process to raise funds from tourism. The intention is for accommodation providers in the Bowland Area to raise a voluntary levy from their guests. This will give visitors to the Bowland AONB Area an opportunity to contribute towards protecting and enhancing the environment and its recreation potential. The project was launched in March and, so far, approximately 40 accommodation providers have expressed a willingness to participate. Several methods of collecting funds have been suggested. Any funds raised will be geared up using appropriate external funding source and spent on local conservation and recreation projects. The Agency contributed .2k in 1999 to publicise and administrate the project.

Urban Fisheries Development Projects

a) Liverpool

The Liverpool Park Lakes project has continued this year with hydrological studies of several lakes and improvement to the access for all users and creation of new angling facilities at Calderstone Park Lake. Most of the year has been spent developing a jointly prepared strategy for the management of Liverpool's Park Lakes with Liverpool City Council. It is believed that the techniques developed by this strategy will be used as the basis for the Environmental Strategy for the whole of Liverpool.

b) Chequer Lane, Skelmersdale

This project is aimed at creating a recreation site on a housing estate in Skelmersdale. Due to insufficient funds, this project has not progressed as much as we would have liked. Our partners, West Lancs District Council, have continued to progress design plans and obtain planning permission. Work in 2000 will centre upon trying to obtain external funds to help finance the continuation of the project.

c) Accrington.

The aim of the project is to develop Platts Lodge, which is located in the middle of Accrington. The project will result in regeneration of the lake and provision of a community area, which will be accessible to the residents and angling clubs of Accrington. The site will be made safe, with paths and fishing pegs installed. Extensive planting schemes will improve the aesthetic appeal and environmental potential. The Agency contributed £8k to this collaborative project with Groundwork, Accrington Anglers and Hyndburn Council.

Riverine Habitat & Recreation Projects

The Agency has actively been promoting maintenance and improvement of riparian river habitat for some years. The river bank is a popular location for both visitors and locals. Two habitat projects completed on the river Lune this year have improved access of public rights of way adjacent to the river as part of the project. This included improving access and providing information/education boards.

Education - Angling Days for Scouts and local Children

Three teach-in angling days were held in Lancashire to encourage youngsters to try the sport, one in Wigan and two at Scorton. The most successful was held on Saturday 2 October when over 30 local scouts from 7 scout groups attended a 1 day training session to part fulfil the requirements for the Scout Angling Badge. The Agency provided some equipment and tuition for all attendees.

Liaison Meetings

Agency Officers have continued to meet with colleagues, local recreation interest groups and statutory bodies, to promote recreation within the Area. This included, attendance of 4 Public Rights of Way meetings, 4 Bowland Technical Officers Group Meetings and 4 Regional Recreation Officers meetings. In addition, two meetings have been held with Borough Councils to develop future projects and part fund one footpath improvement project on the river Wyre.

WATER RESOURCES ISSUES

Catchment Abstraction Management Strategies (CAMS)

Following the drought in the mid 1990s and the increased awareness that some abstractions could potentially damage the environment, the government undertook a review of the abstraction licensing system. Its final decisions were published in March 1999 in the document 'Taking Water Responsibly'. This document will result in major changes to the abstraction licensing system. One of the proposals set out in the document was the development of a CAMS for each catchment.

During 1999 the Ribble Catchment was nationally one of four catchments to develop a trial CAMS. The national trial involved two regions working in partnership, a lead region and a 'buddy' region, to develop a CAMS document for the trial catchment. The Ribble trial had a multifunctional approach, with Ecology, Fisheries and Water Quality involved from the start, led by Water Resources. A major bonus in the development of the Ribble CAMS was the fact that work had already started on a GIS system specifically designed to incorporate and help interpret all the data which would be needed to assess the potential water available to abstractors. Being involved from the onset enabled comments, questions and issues to be raised at the earliest opportunity. Ecological information proved invaluable in the development of the trial CAMS and also set a premise when the development of the actual CAMS takes place from April 2001.

WATER QUALITY ISSUES

Sheep Dip Survey

Since sheep dip became a major issue for the Agency, heightened by the introduction of Synthetic Pyrethroid formulations, a number of initiatives have been undertaken, from local campaigns through regional awareness to national influence, both inside and outside the Agency through its Rural Land Use Group. Ecologists in Central Area undertook a survey of the Lune, Ribble and Hodder catchments to

assess the impact of sheep dip in 1999. A total of 220 sites were surveyed in August and November.

Preliminary Results

The summer survey did not detect any dip-related incidents. This is consistent with comments from sheep farmers that they were not dipping in the summer, but using other methods such as pour on, showers and injections. Most were only dipping in the autumn. The autumn survey detected two incidents which have been confirmed as sheep dip pollution, a third one remains unconfirmed.

To raise awareness in the farming community of the issues regarding sheep dip, Agency staff from both Environmental Protection and Ecology have given talks to specific groups and used Agency exhibits at agricultural shows to spread the message. Press coverage of incidents in local papers have also helped to highlight issues.

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WATER QUALITY

Hockery Brook

An investigation into the minewater problem in Hockery Brook in the Glaze catchment has now been completed. A summary report has been pulled together detailing the chemical, biological, fisheries and aesthetic problems with the watercourse. A source of funding is now being sought.

Groundwater Regulations

The Groundwater Regulations (1998) require land managers to require consent from the Agency before disposing of a wide range of substances to land. The major consequence of this was that farmers needed consent to dispose of spent sheep-dip and pesticide washings to land for the first time in 1999/2000. The ecology section in South assessed over 300 such applications for their impact on ecological interests. Many sites needed conditions to avoid disposal within or adjacent to sensitive sites and a few applications required a more rigorous assessment when they fell within or adjacent to sites falling under the Habitats Directive.

PROMOTIONAL WORK

FACT/ECOADS

This project is being driven by English Nature and is supported by the National Trust, English Heritage, Wildlife Trusts, FWAG, FRCA, Forestry Commission, RSPB, the Royal Agricultural College and the Environment Agency. The idea behind the Eco-Ads project is to pool current information on conservation techniques and make it more accessible to practical land managers.

The magazine provides a self-help network to enable environmental managers to source information essential to management of their wildlife sites on an exchange and mart basis. This could include finding suppliers of specialist seed mixes, sourcing a consultant with specific expertise and advertising events. A copy of the magazine will be available.

BIODIVERSITY

Barn Owls and Otters on The River Gowy

A detailed Habitat Management Plan for Otters on the River Gowy was drawn up in collaboration with Cheshire Wildlife Trust this year. The River Gowy has recent records of Otters moving in to occupy

the river from adjacent strongholds in Wales. Actions in the plan should further enhance Otter habitat and river management on the Gowy.

The Gowy is also a stronghold for breeding Barn Owls in Cheshire. This year a range of artificial nest boxes for Barn Owls were put up along the river in collaboration with the Cheshire Wildlife Trust.

North West Wetlands Project

A systematic search for areas where the restoration of lowland wetland types (fen, wet grassland and reedbed) could be feasible was undertaken this year as a part of this regional project. This project follows the Agency's responsibilities for wetlands under the UK Biodiversity Action Plan. The final document should be the key source document on the subject for years and should help effectively target any subsequent efforts at restoration. Key sites identified in the Area included Whitley Reed, the Hey Brook Corridor and the lower River Gowy.

Meres and Mosses

The collaborative study (with English Nature) to determine the baseline condition and key management issues associated with the Meres and Mosses continued through this year. The Meres and Mosses are a group of internationally important open water and peatland sites scattered across the north west Midlands. The Agency has supplied much information needed by the project on water quality, hydrological and biological issues. The final information should provide the background information required for effective conservation assessment and management of sites. It is hoped that there will be a Project Officer appointed to take forward some of the issues associated with the meres and mosses by targeting agri-environment funding opportunities at relevant sites to promote effective management of surrounding land.

Wolvervoles

The ecology section highlighted the issues facing our native water vole, by conducting a number of training events for the Clear Glaze Partnership, Bury Environment Forum and our own Flood defence and Emergency Works Unit staff throughout 1999. This was to enable the participants to identify a water vole's riparian habitat and to understand the threats this endangered mammal is facing in the UK.

The Environment Agency in collaboration with the Clear Glaze Partnership undertook a water vole survey of the River Glaze catchment to gather baseline population data. This research enabled water vole habitats to be considered in relation to planning applications and channel management works.

Local volunteers, trained by the Environment Agency and supervised by the Clear Glaze Partnership carried out the survey in summer 1999. Approximately 15% of the watercourses in the Glaze Brook catchment were surveyed in accordance with a standard methodology. 500m lengths of watercourse were checked for signs of water voles such as burrows, latrines and feeding stations. All volunteers were trained in Health and Safety guidelines and were insured through the Clear Glaze Partnership. It is hoped that more sites will be surveyed in summer 2000.



Environment Agency restores wildlife haven to former glory

FLOOD DEFENCE

Working with flood defence staff on key schemes continues to be a major source of ecological improvements. Some key examples are given.

Gowy Flood Alleviation Scheme (FAS)

Of particular note is the completion of the design for the River Gowy and Thornton Brook FAS near Stanlow in Cheshire. The lower reaches of the Gowy flow into the Mersey Estuary and are subject to periodic flooding and this is of particular concern where it flows through the Stanlow Manufacturing Complex which includes an extensive area of oil refineries. Here flooding can have a major economic impact as well as potentially taking industrial pollutants into the Mersey estuary SPA just downstream. There is only minor ecological benefit that can be gained for the river through this area, however significant opportunities avail themselves upstream of this area in the Gowy Meadows.

The Gowy Meadows are a washland area important for birds and plants. The ditches present are designated as a Site of Biological Importance (SBI) for their aquatic plants and invertebrates. The proposal is to use this area as a huge washland area capable of storing flood flows and thus re-creating a huge area of wet grassland / wetland capable of supporting wetland bird and plant communities. This area will incorporate the Thornton Brook channel, which flows through the refinery area at present in a very degraded state. The new channel flowing through the meadows has been designed to be of much greater wildlife value and should bring the added benefit of allowing flooding onto the meadows from this water source as well as the Gowy. Flooding of the meadows will be done in line with a Water Level Management Plan for the site. This year a substantial baseline survey of major species groups on the site was undertaken to both ensure that existing interests are maintained and that there is a future 'ecological baseline' from which to monitor any changes on the site. It is hoped that the whole area will eventually be taken over by Cheshire Wildlife Trust who will work with the Agency on what will become a major wetland nature reserve.

River Etherow Scheme - Landscaping

March 2000 saw the completion of the River Etherow Flood Alleviation Scheme after three years of work. Ecology has had significant input into the scheme, which involved work at several locations along the River Etherow, from Woolley Bridge to Bankwood Mill.

The main landscaping work was undertaken adjacent to the Etherow Industrial Estate at Woolley Bridge and along a section of Hadfield Brook. The work within the Etherow Industrial Estate involved planting of trees and shrubs along sections of floodwall to help soften the appearance of the new stonework. In addition a small pond just upstream of Woolley Bridge was enlarged and re-profiled to provide an attractive water feature for the local community.

Work on Hadfield Brook consisted of tree planting along both banks and the creation of low-lying berm areas adjacent to the stream to encourage the establishment of wetland plants.

It is hoped that all these measures will help enhance the appearance of the new structures and provide attractive habitat for local wildlife.

Nantwich Scheme

The environmental improvement works associated with the River Weaver at Nantwich continued into their second year. These works are planned alongside works to alleviate flooding in the Nantwich area over a three-year period. A comprehensive ecological enhancement plan has been drawn up for the area. Works this year included pollarding a large number of riverside willows and tree planting. Further planting and works to improve the river channel are planned for the final year during 2000/01.



Pollarding trees

Sandbach Flashes

The Sandbach Flashes, Sites of Special Scientific Interest, are a number of wetland areas renowned for their wildlife, providing home for some rare and unusual plant species, as well as attracting large numbers of waders and wildfowl. The Agency's Emergency Works Unit repaired a breach in a floodbank at Elton Flash, near Warrington, caused by high flows from the adjacent River Wheelock. The Environment Agency's Ecology, Flood defence and EWU sections worked jointly with English Nature (the statutory wildlife protection body) and local farmers to ensure that the flashes' ecological value is protected for the future, and enabled the sympathetic management of the land to continue.

The Sandbach Flashes consist of a series of pools formed as a result of subsidence due to the solution of underlying salt deposits. This subsidence has formed freshwater and saline lakes. These inland saline wetlands are extremely rare and are of national wildlife interest because of their unusual associations of plants and animals. The aim of the bank reconstruction works was to restore the flash to its former state, by reducing water levels and allowing the numerous waders and wildfowl associated with the site to feed on the exposed mud flats. The water quality was restored to its former

partially saline state, aiding plant and invertebrate species tolerant of this rare inland salty habitat.



Digger at Sandbach flashes

INVASIVE PLANT POLICY

Alien plants are extensively distributed in South Area, in particular much attention has focussed upon Giant Hogweed, Japanese Knotweed and Himalayan Balsam. However these plants frequently follow the patterns of extensive catchment disturbance in the Mersey basin as opposed to them actively invading areas of high environmental value. South Area has previously trialled catchment-based eradication of alien plant species but this has not proved to be successful and further such initiatives are not supported as being neither practical nor possible.

South Area's new policy states that localised control of invasive alien plants should only be attempted where: -

There are risks to flood defence structures.

There are risks to the health and safety of the Agency's workforce regarding repeated access and Giant Hogweed.

There is a high risk to sensitive ecological features and the proposed control measure is under-pinned by a sound understanding of the plant's environmental impact mechanisms.

There is adequate monitoring of the effectiveness of treatment.

Any movement of soils containing invasive plants follows the 'duty of care' in relation to waste.

Where external organisations and bodies undertake riverside development of land where alien plants are present, the Agency will provide advice and authorisation for any associated herbicide application and waste disposal issues in order to limit further unintentional introductions.

Floating Pennywort

In autumn 1999 Floating pennywort (*Hydrocotyl ranunculoides*) was first recorded in south Area. It has been found in 2 ponds in Greater Manchester, but more worryingly in the R. Weaver between Winsford and Northwich. This plant is an aggressive invader capable of completely carpeting slow-flowing rivers and still-waters. The extent of colonisation has been mapped, and following a meeting with British Waterways (BW) and other interested bodies, a strategy for the eradication of this plant has been agreed. Control will commence in April with a partnership approach adopted between the EA and BW. Further monitoring will take place at the end of the summer, and the following spring, to determine whether the operation has been successful and if further action is necessary.



Floating Pennywort

HABITATS DIRECTIVE

The Government's implementation of the EC Habitats Directive is in the process of creating a network of internationally protected sites in the UK known as Special Protection Areas (SPAs) and Special Areas of Conservation (SACs). These sites will then receive the highest level of legal protection afforded to UK nature conservation sites.

The Agency is a 'Competent Authority' under the same legislation and has specific duties to protect these sites. The key measures are:

The requirement to critically assess the impact of any 'new' licence, permission, permit, plan, authorisation etc (hereafter called 'authorisation'), which may have an effect on the named nature conservation value of these sites.

The requirement to 'review' existing authorisations which may have an effect upon these sites by 2004.

A 'Habitats Group' has recently been created to progress implementation of the Directive in South Area. Work on the 'review' this year has focussed

on the three priority 'Meres and Mosses': Oak Mere, Abbots Moss and Wybunbury Moss. Initial assessment of current key water resource and pollution control issues has been undertaken in conjunction with English Nature. Full 'Appropriate Assessment' of Agency activities and authorisations is likely to follow in 2000/01 when the sites should possess full 'conservation objectives' from English Nature.



Abbots Moss

Mersey Estuary Spa and Oak Mere SAC

Aside from the 'review' of consents work associated with existing licences there has been a number of 'new' applications requiring consideration under the Directive. There have been a large number of issues associated with Oak Mere over the year. The site is a SAC being a rare example of nutrient poor lowland mere. However, the site is surrounded by mineral extraction and there has been concern that the sites' water levels have been falling in recent years. There have been a number of new proposals put forward for further minerals working this year. These proposals required rigorous assessment with respect to potential impacts on the water level in the mere, which the Agency is trying to maintain at a favourable status.

There have been a number of applications requiring close scrutiny in connection with the Mersey Estuary SPA. This include changes to existing discharge consents in the estuary and applications for new 'Ro-Ro' ferry's.

There were initial consultations over two options for a new proposed Mersey crossing to the east of the existing Runcorn to Widnes bridge and of the SPA. The Mersey Estuary is recognised as being an internationally important nature conservation site and this is reflected by its designation as a Special Protection Area (SPA) under the European Union Birds Directive (79/409/EEC) and as a candidate Ramsar site. In addition the lower estuary is also designated as a Site of Special Scientific Interest

(SSSI) and the upper estuary as a Site of Biological Importance (SBI). These designated sites contain a number of vulnerable habitats including saltmarsh and intertidal sand and mud-flats.

The Agency's concerns may be summarised as follows:

Physical destruction of habitats. Both of the routes identified cross the Upper Mersey Estuary SBI. This site consists mainly of large areas of intertidal sand and mud-flats together with saltmarsh. It is of year round importance due to the large numbers of waterfowl and waders for which it acts as a feeding, breeding and roost site. These habitats would suffer severe damage during construction if either of these two crossing routes were used. Both saltmarsh and intertidal habitats are highlighted in the UK Biodiversity Action Plan (UK BAP) as being of priority nature conservation value.

Disruption of the hydrodynamic regime. Both saltmarsh and intertidal flats are dependent on a dynamic interplay of erosion, deposition, flow and other factors that regulate their extent and other characteristics. The construction of a crossing could have a significant effect on the hydrodynamic regime in the estuary leading to large scale and irreversible changes to the nature and extent of habitats present

Fragmentation of existing habitats. Small, fragmented areas of habitat are invariably at greater risk from both natural perturbation and human activities than larger ones and tend to support fewer species. The inter-tidal and saltmarsh habitats in the Mersey Estuary have already suffered from a high degree of fragmentation and land claim in the past and the Agency therefore considers the preservation of that remaining to be of paramount importance. This is particularly so for relatively large areas such as Wigg Island and Runcorn Sands.

Mobilisation of sediment bound pollutants. Many of the sediments in the Mersey Estuary are contaminated with a range of pollutants such as heavy metals. There is concern that disturbance of these sediments which would arise as a result of the construction of the crossing could lead to the movement of sediment-bound pollutants to the water column.

Given the potential impacts listed above, the proposal is likely to legally require two specific environmental appraisals: Environmental Impact Assessment (EIA) and an 'Appropriate Assessment' by the 'Competent Authority' under the Habitats Directive.

Another major contentious development concerned the proposed development and associated loss of the Widnes Wharf Site of Biological Importance (SBI) saltmarsh just upstream of the SPA. The loss of a large area of a key biodiversity habitat resource coupled with the need to import vast quantities of 'infill' material in order to develop the site make the proposals unacceptable from an ecological and flood defence perspective. The close proximity of the Mersey Estuary Special Protection Area (SPA) and the ability of the development to impact upon estuarine processes would again make it seem likely that proposals for development would therefore require a full EIA and an 'Appropriate Assessment'.

DEVELOPMENT CONTROL

River Mersey: proposed development of Woolston deposit grounds

The Environment Agency remains concerned at the potential loss of a significant length of the River Mersey through the proposed deposit of dredgings into an old loop of the River Mersey to the east of Warrington. The river is of local conservation value itself and supports a range of protected species. It flows through the Woolston Eyes SSSI (the largest SSSI in Cheshire) and there is great concern at the potential impact on the SSSI through increased disturbance factors and hydrological impacts. There is also significant local recreation interest with a public right of way alongside the old ox-bow and local people are very concerned at the proposals.

The Agency is surprisingly not the drainage authority for the Mersey in this vicinity and so our controls are limited. The Agency is the drainage authority for the Thelwall Brook flowing into the loop and the Agency has withheld consent for diverting this brook in to the Mersey downstream and away from what would be the new deposit grounds. This has resulted in half of the meander being saved in order to allow flow from Thelwall Brook to continue as at present. However, the Agency would like to see an assessment of a full range of options for dredging deposits.

Manchester Airport Mitigation

Biological monitoring is continuing on the channel restoration works associated with the airports' new runway. This includes both the Sugar Brook diversion and the new River Bollin 'tunnel' under the new runway. Initial surveys on the new Sugar Brook diversion showed sparse invertebrate populations but further surveys carried out in 1999,

showed a marked increase in species populations and diversity.

Downstream mitigation works have now started on the River Bollin. At present it has been diverted through one new meander and it is due to go through a further two meanders by the end of August 2000.

RECREATION

River Birket Cycle Route – Pasture Road to Reeds Lane

The Agency has been a major partner in the creation of a local cycle route adjacent to the River Birket on the Wirral. This will complete a link from the North Wirral coats to places of employment, schools, open space and the National Millennium Cycle Route.

Groundwork Wirral managed the project and partners included the Metropolitan Borough of Wirral, Bristol Myers Squibb and RiVa 2005. Land was donated by Hillside Holdings/Premier Brands and Wilcon Homes North West Ltd. The partnership funding was able to release £30,000 of European funding.



The route was completed at the end of March and is already being extensively used.

APPENDIX

CONSERVATION RESOURCES IN THE NORTH WEST

DID YOU KNOW ?

- 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, Nettle 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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