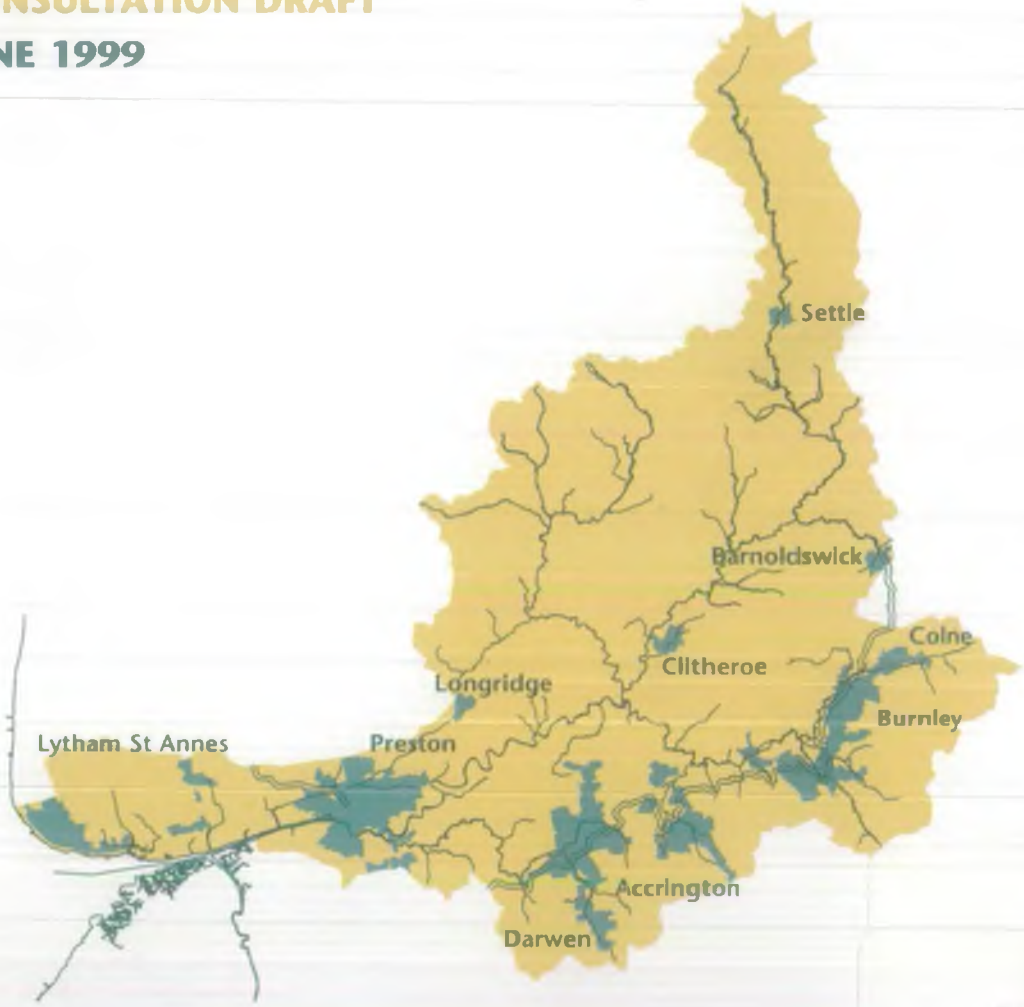
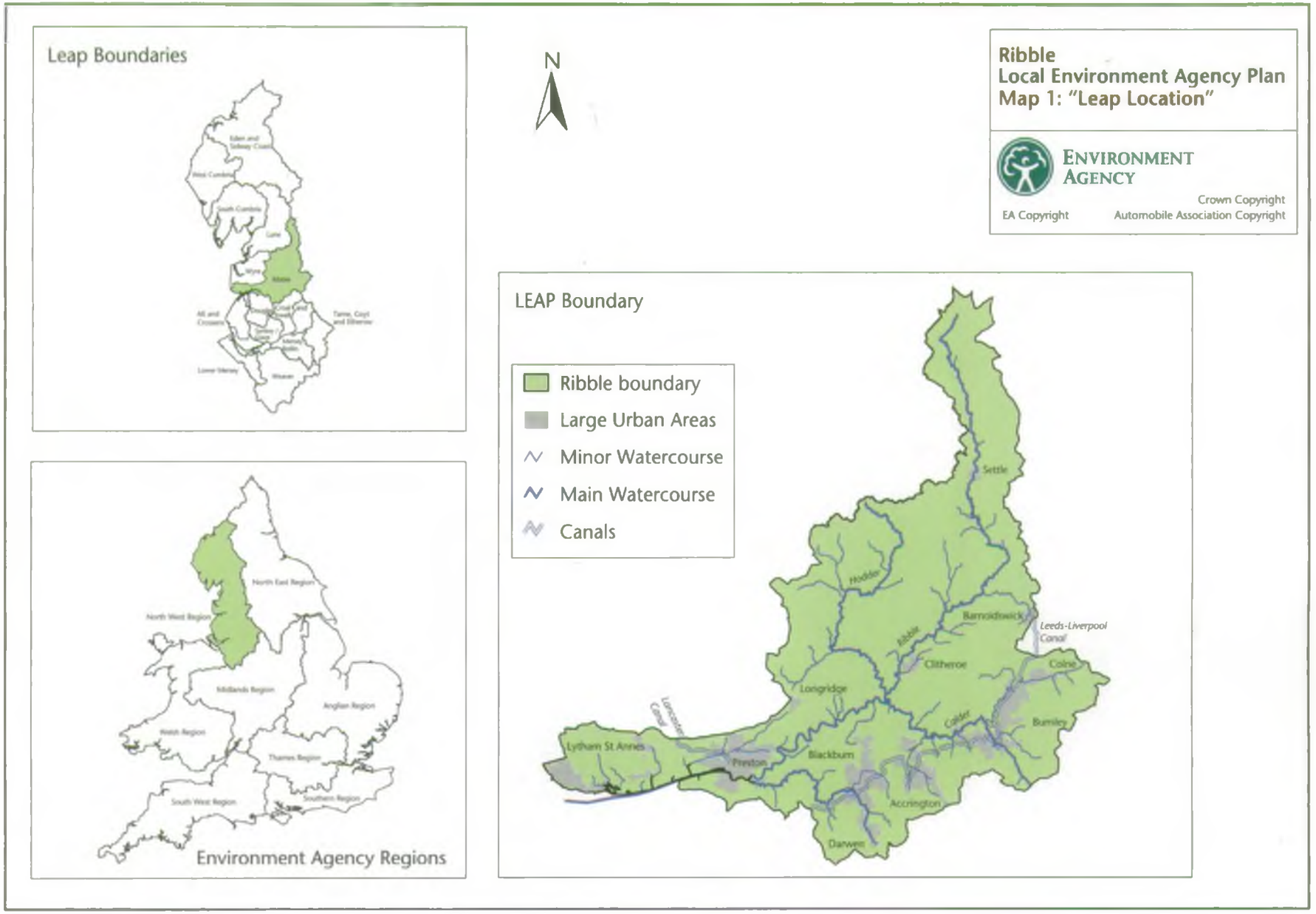
local environment agency plan

RIBBLE

CONSULTATION DRAFT

JUNE 1999





FOREWORD

I am very pleased to introduce the Local Environment Agency Plan Consultation Report for the Ribble LEAP Area. This consultation forms part of a new and innovative approach to identifying, prioritising and solving local issues that are related to our duties and responsibilities.

The Consultation Report will highlight a list of issues that we have prioritised for action. We are going to consult, as we want to benefit from local knowledge to ensure that we will take action on the most meaningful issues for the local area. We also want to make the most of opportunities to support and be supported by other organisations in this action.

We hope that the outcome of the consultation will be a strong partnership approach ensuring real environmental improvements in the Ribble area.

I invite you to consider the content of this document and to raise any issue, comment or suggestion that you feel may assist us in making a positive difference to your local area. The consultation period ends on Tuesday 30th November 1999.

P C Greifenberg
Area Manager
Central Area

If you wish to discuss any matters in this Consultation Report, please contact:

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South Preston
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Telephone: 01772 339882.

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MAP CONTENTS

THE LEAP PROCESS

Introduction to the LEAP Process

Local Environment Agency Plans (LEAPs) help to identify, assess and resolve local environmental problems or opportunities for enhancement. We have identified problems and opportunities as issues that relate to our environmental themes.

The themes are:

Managing Water Resources

Delivering Integrated River Basin Management

Managing Freshwater Fisheries

Conserving the Land

Enhancing Biodiversity

Managing Waste

Improving Air Quality

Addressing Climate Change

Regulating Major Industry

Within this LEAP document each issue that has been identified is related to one of our environmental themes. Often an issue will relate to more than one theme and the use of icons indicates these links within the document.

Our environmental themes relate to our responsibilities that include, managing and regulating the water environment, controlling waste management, regulating emissions from major industrial processes and contaminated land. We also have duties to protect and enhance biodiversity, to protect the landscape and heritage and to promote recreation.

This LEAP will result in a series of actions that over the next five years will improve the local environment.

The Ribble LEAP Consultation Report

This consultation report is publicly available from the 15th August and people are free to comment on the issues and proposed solutions. Following a three month period of consultation the report is reviewed to take into account these new views resulting in the production of an Action Plan which will be published Winter 1999.

The Action Plan describes the programme of work required, over the next five years to address the issues agreed in the consultation report. Annual Reviews are produced to monitor the progress of the action plan over the five-year period.

The Scope of LEAPs

A LEAP cannot manage each and every matter related to the environment. We only have the authority and resources to plan for those matters which are related to our statutory duties and responsibilities. However, where there are common areas of environmental concern LEAPs attempt to influence third parties to plan and act in ways that support our Environmental Strategy. The boundary between resolution and influencing is not always clear cut. In deciding on which issues to address it will be important to consult key external partner organisations, especially Local Authorities.

The Ribble LEAP Area

The River Ribble is one of the longest rivers in the North West of England, draining a catchment area of 2128 square kilometres and covering a distance of 110 kilometres from source to mouth.

The Ribble originates high in the Pennines at Newby Head Moss at an altitude of 422 metres. The river cascades down having the Yorkshire Dales National Park to the east and the Forest of Bowland to the west.

In the upland catchment the major use of the land is for farming, being based around small villages and hamlets such as Horton-in-Ribblesdale and Long Preston. This part of the Ribble attracts visitors enjoying many recreational activities including fell walking, particularly in the area between Settle and Horton-in-Ribblesdale, salmon and coarse fishing supported by the high quality waters.

The mid Ribble is joined just south of Clitheroe by two major tributaries. The River Hodder rises in the Forest of Bowland and provides a large proportion of the drinking water supplies for Blackburn and Hyndburn. The River Calder, crossing East Lancashire, contrasts to the Hodder in that it is in recovery from previous industrial areas, exhibiting many pollution relics such as minewater, contaminated land run-off and sewerage discharges.

The Ribble area has a mixture of rural and urban features. The Ribble area's land use is still predominantly rural. In 1991, only 10.2% of the area was urbanised. Towns such as Preston, Blackburn and Burnley featuring prominently and providing most of the areas industrial and manufacturing base. Preston in particular has experienced significant urban growth of approximately 12% in the fifteen years period from 1976-1991 (source: Lancashire's Green Audit 2: A Sustainability Report 1997). This development of course impacts on the rural environment.

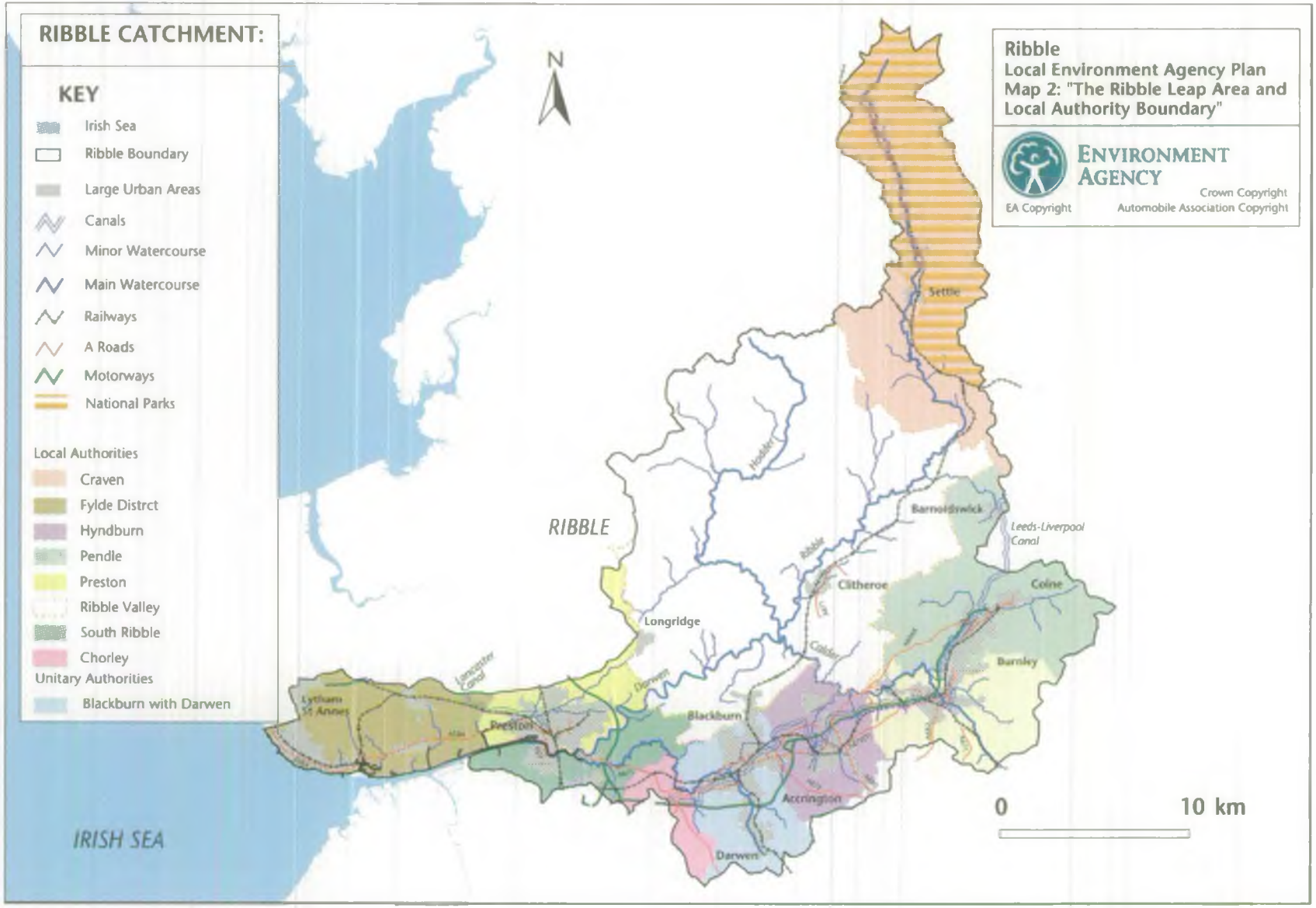
The rural features within the Ribble area include farming and many recreational features such as fell walking, salmon and coarse fishing (which the high quality waters support).

Protection and Partnership

Where appropriate we will work with partners to achieve environmental protection and improvements. Examples include negotiation between Agency staff and representatives of individual companies over programmes of investment to improve environmental performance or assistance afforded by the Police in difficult enforcement action.

We are taking a pro-active role in the land-use planning system. We consider Local Environment Agency Plans to be an important part of the on-going dialogue with Local Planning Authorities to foster partnerships and identify issues, where environmental problems and opportunities can be pursued, especially in relation to their Development Plans.

We see the Ribble LEAP consultation process as an opportunity to develop new partnerships to help us to deliver the actions required to solve the issues that are identified. We also seek to add value to the work of other organisations that are committed to environmental protection and enhancement in the Ribble Area.


RIBBLE CATCHMENT:
KEY
Irish Sea
Ribble Boundary
Large Urban Areas
Canals
Minor Watercourse
Main Watercourse
Railways
A Roads
Motorways
National Parks
Local Authorities
Craven
Fylde Distrct
Hyndburn
Pendle
Preston
Ribble Valley
South Ribble
Chorley
Unitary Authorities
Blackburn with Darwen
N
Ribble
Local Environment Agency Plan
Map 2: "The Ribble Leap Area and Local Authority Boundary"
ENVIRONMENT AGENCY
EA Copyright
Crown Copyright
Automobile Association Copyright
RIBBLE
IRISH SEA
Settle
Barnoldswick
Leeds-Liverpool Canal
Clitheroe
Colne
Longridge
Burnley
Blackburn
Preston
Lytham St Annes
Accrington
Darwen
0
10 km

State of Water Resources in the Ribble Area

Water is a resource of vital importance to domestic and industrial consumers. An adequate supply of clean water is fundamental to public health. Water also plays an essential role in many industrial processes, including food production, power generation and chemical manufacture.

However, water is a finite resource. When fresh water is abstracted there is a reduction in the amount of water naturally available in rivers and aquifers. Excessive abstraction will cause serious environmental damage downstream. Animals that need water to breed are especially vulnerable. So a sustainable balance needs to be achieved between supply and demand.

In addition when river flows fall there is less water to dilute permitted discharges of industrial effluent and treated sewage. This may lead to deterioration in water quality.

Within the Ribble area water is abstracted from surface waters and from groundwater.

Surface water is abstracted from a number of sites for a number of uses. The main use being for the public water supply. North West Water Ltd has the sole responsibility for the supply of this water (referred to as potable water). Groundwater may be abstracted from water bearing rocks (aquifers) by means of wells or boreholes, or by making use of naturally occurring springs.

The major Sherwood Sandstone aquifer of the Fylde, see **Map 3** is exploited extensively by boreholes for public water supply. In the Preston area there are also a number of industrial supplies from the aquifer.

The groundwater in the aquifer is generally of a high quality except in the vicinity of the Ribble Estuary where some saline intrusion may occur. However, it will have been prone to contamination from past and present land usage, particularly in urban areas like Preston where low permeability drift cover is thin, see **Map 3**.

Pressures on the Water Resources in the Ribble Area

The amount of water available to form the water resource of the area is dependent upon the rainfall, which is variable. The main pressure exerted on the water resource is the amount abstracted for use and demand is predicted to rise by 10% in the North West over the next 25 years. This demand will have to be met by the same amount of water resource so it is important that other pressures, such as loss due to leakage's in the distribution system and loss through pollution are minimised.

Achievements since the first Consultation Report, (1995)

The first Consultation Report for the Ribble was the Catchment Management Plan, which was, produced by one of our predecessor organisations the National Rivers Authority. Since that report several key actions have been taken to safeguard the water resource of the Ribble area. These include:

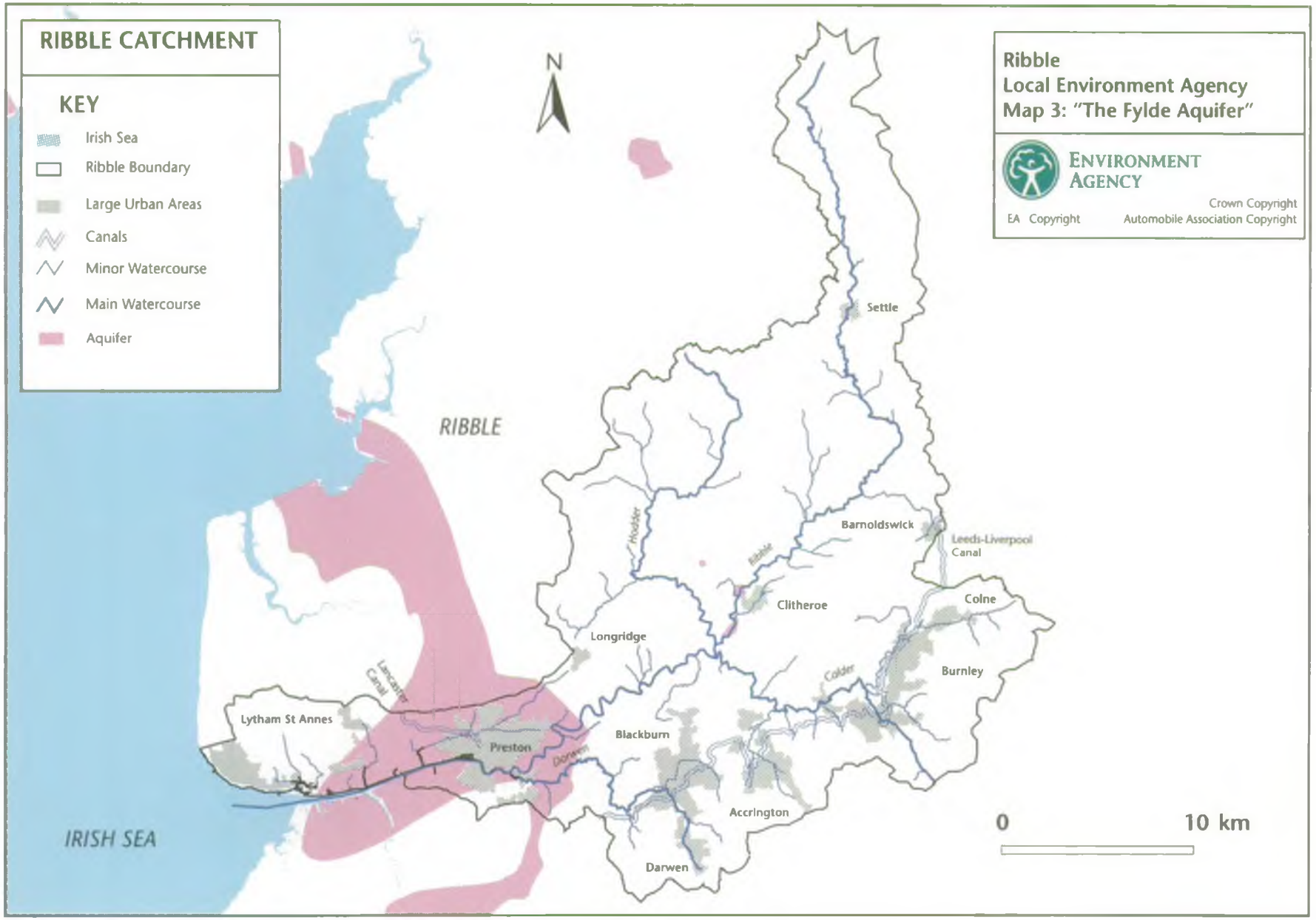
- The development of a strategy to protect the groundwater resources of the Fylde Aquifer.
- Negotiated with North West Water Ltd to prevent further abstractions from the River Hodder.
- Brokered an agreement with North West Water Ltd and Anglers to ensure more efficient use of Stocks Water Bank.

Whilst improvements have been achieved there are still issues to be resolved to allow for the continual protection of the water resource in the Ribble area.

Issues Relating to the State of Water Resources in the Ribble Area

Issue 1 Protection of Fylde Aquifer.

Issue 2 Low flows in the River Hodder.


RIBBLE CATCHMENT
KEY
Irish Sea
Ribble Boundary
Large Urban Areas
Canals
Minor Watercourse
Main Watercourse
Aquifer
N
Ribble
Local Environment Agency
Map 3: "The Fylde Aquifer"
ENVIRONMENT AGENCY
Crown Copyright
EA Copyright
Automobile Association Copyright
RIBBLE
IRISH SEA
Settle
Barnoldswick
Leeds-Liverpool Canal
Clitheroe
Colne
Longridge
Burnley
Lancaster Canal
Lytham St Annes
Preston
Blackburn
Accrington
Darwen
0
10 km

ISSUE 1: PROTECTION OF THE FYLDE AQUIFER.

The Issue: Groundwater abstractions from the Fylde Aquifer are resulting in low flows in the Ribble and Wyre catchments.

Background to the Issue: Water is abstracted from the Fylde Aquifer mainly by North West Water Ltd to supply drinking water. In the Preston area there are also a number of industries that abstract water for their commercial processes. These types of abstractions require a licence from us.

If the rate of abstraction is greater than the rate at which the water resource is replenished then it can lead to low flows in rivers.

Possible Solutions: We need to gain a better understanding of the flows in the rivers and how they relate to the rate of abstractions from the Fylde Aquifer.

Solutions	Responsibility	Benefit	Timescale
Increase Groundwater monitoring network, especially those near important habitat sites.	The Agency.	Helps gain a better understanding of the problem.	1999-2000.
Install new flow gauge at Woodplumpton Brook.	The Agency.	Helps gain a better understanding of the problem.	1999-2000.
Develop Management Strategy for Fylde Aquifer.	The Agency.	To ensure sustainable use of the aquifer.	Publish by 2001.

ISSUE 2: LOW FLOWS IN THE RIVER HODDER.

The Issue: The River Ribble is a major salmonid fishery whose productivity, together with most salmonid fisheries nationally, has declined in recent years. Reduced flows within the system can seriously impact on the fish populations.

Background to this Issue: Low flows cause a number of problems that impact upon fish. Their migrations are hindered, and, as migratory fish can spawn during periods of elevated flow, subsequent low flows result in the drying out and loss of the eggs. Low flows also cause a reduction in the available habitat area.

A main factor causing low flows in the Hodder is the number of North West Water Ltd abstractions used to supply water to the Blackburn area.

Possible Solutions: We are currently negotiating with North West Water Ltd to rationalise the siting and influence of water intakes on the Hodder in an attempt to reduce their impact on the ecology of the river. We will also assess in more detail the impact of low flows on fisheries within the Ribble catchment as a whole, particularly during droughts.

Solutions	Responsibility	Benefit	Timescale
Assess the impact of low flows on the fishery.	The Agency/ North West Water Ltd. Other abstractors.	Determine baseline levels.	2000-2005.
Reduce abstractions from the affected areas.	The Agency/ North West Water Ltd. Other abstractors.	Increased quantity of water available to the areas.	2000-2005.
Rationalize the points of abstraction.	The Agency/ North West Water Ltd. Other abstractors.	Increased quantity of water available to upstream sections of the area.	When agreements are reached and funds are available.
Determine minimum biologically acceptable flow.	The Agency.	Provide baseline information.	2000-2005.

Constraints: Failure to reach agreement with North West Water Ltd and other abstractors.

Delivering Integrated River Basin Management is concerned with ensuring that in the Ribble area there is the right quality and quantities of water in the right place at the right time.

This means safeguarding water from pollution and ensuring that rivers, canals, standing waters and aquifers have enough water to support the wildlife that lives there and to provide enough water for our domestic and industrial needs. An aspect of managing the river basin to ensure that the right quantity of water is in the right place at the right time is to develop strategies to deal with uncommon natural events such as droughts and floods.

This approach of considering how different aspects of river basin management interlink should also ensure that people gain the maximum benefits from the area including opportunities for recreation, whilst ensuring that wildlife is protected and able to flourish. The sections in this document 'Managing Freshwater Fisheries', 'Conserving the Land' and 'Enhancing Biodiversity' deal in more detail with these later themes.

State of Water Quality in the Ribble Area

Freshwater Quality: The River Ribble is one of the largest rivers in the North West draining a catchment area of 2128km² and covering a distance of 110 km from source to mouth. The Ribble Catchment also includes the Hodder, Calder and Darwen rivers. There are also stretches of the Lancaster Canal and the Leeds-Liverpool Canal along with 14 major reservoirs.

It is human activity that predominately influences water quality as rivers have been used to dilute and carry away domestic and industrial effluent. As the Ribble rises in a predominately rural area and then picks up water from land on the more urbanised eastern side of the catchment it is in this area that its quality becomes more affected by discharges.

The water quality of rivers and canals is reflected by their General Quality Assessment (GQA) classification and as can be seen on **Map 4** the vast majority of watercourses (88.5%) are classed as good to fair.

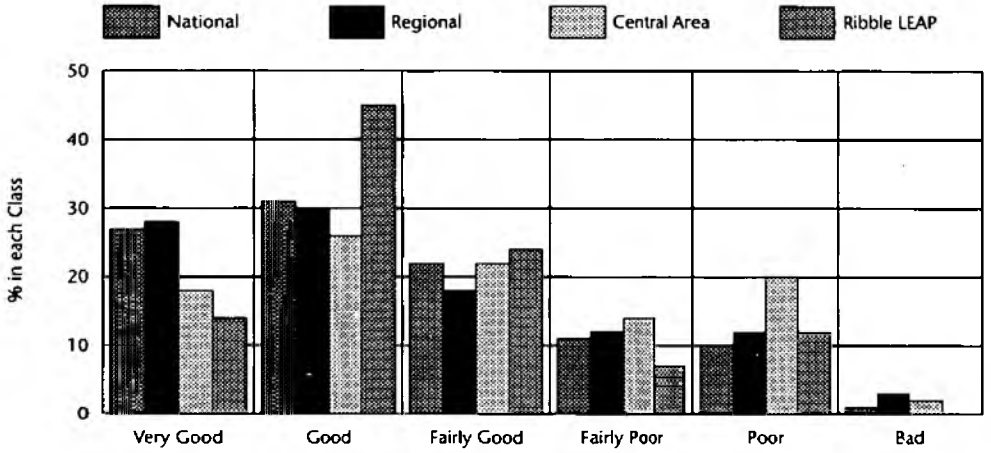
Table 2 below gives more detailed breakdown.

Table 2 – Water Quality 1993-1997

GQA Class		km		%	
(Chemistry)		1993-1995	1995-1997	1993-1995	1995-1997
A	Very Good	40.2	73.4	7.4	13.5
B	Good	204.5	241.3	37.7	44.5
C	Fairly Good	164.2	123.5	30.3	22.8
D	Fair	64.5	41.8	11.9	7.7
E	Poor	61.2	62.0	11.3	11.4
F	Bad	7.6	0.2	1.4	0.1
	Total	542.2	542.2	100.0	100.0

There has been a steady improvement in water quality since 1995 with 58% of the classified watercourses in the area presently being classified as either very good or good compared to 46% in 1993. There has been a small drop in the total length of watercourse classified as either poor or bad.

The bar chart below compares percentages of watercourse in each GQA Chemistry class for the UK, the North West Region, the Agency's North West Region Central Area and the Ribble LEAP area. Whilst the general distribution for each data set is more or less consistent, the higher percentage of watercourses classified as either very good or good within the Ribble LEAP area is evident.



To aid the process of managing and reporting water quality we also utilise the Water Quality Objectives (WQO) scheme and European derived Environmental Quality Standards. These are described in greater detail in **Appendix 1**.

Coastal and Estuarine Water Quality: The quality of the estuarine and coastal waters of the Ribble is important both for the wildlife and the human activities that take place there. Some of the wildlife sites are of international importance whilst the estuary borders on to stretches of coast that are the busiest for tourism in England and Wales as well as providing opportunities for local recreational activities.

The majority of the Ribble estuary is classed as fair quality with the final 4.8 km classed as good. The poorer water quality is found in the short tidal stretches of the Ribble estuary tributaries, see **Map 4**. The biggest problem is that the bathing waters around Lytham St Annes fail to meet European Directive Standards.

Pressures on Water Quality in the Ribble Area

The water quality of the river is mainly affected by discharges. These can be point source discharges, such as those arising from sewage and industrial effluents, which the Agency monitors and regulates or from diffuse sources, such as run-off from agricultural and urban land. Controlling diffuse sources is often more difficult, requiring either good practice or restrictions in the use of certain substances.

The sewerage system delivers effluent from domestic properties and industrial premises to Wastewater Treatment Works (WwTW). There it is treated and then discharged into freshwaters, estuaries or directly into the sea. The treated water may still contain solids; nutrients and chemicals at levels that have a polluting effect on water quality. The main discharger into the Ribble area is North West Water Ltd (North West Water) who have 42 Wastewater Treatment Works (WwTW) in the area.

In parts of the Ribble area rainwater runs over land and is diverted into drains which discharge straight into the watercourse without passing through a Wastewater Treatment Works. This can be a potential source of pollution to the freshwater system, especially at times of storms after a dry spell.

The quality of water can also be affected by man's use of chemicals, particularly by agricultural businesses where chemicals are spread or find their way on to the land and then into watercourses.

Historically in the North West there has been extensive mineral extraction. The abandoned workings can lead to water pollution as freshwater runs through them picking up and/or dissolving chemicals.

Achievements since the first Consultation Report, (1995)

Since the first Consultation Report was produced for the area several key actions have been taken to improve water quality. These include:

- The installation of phosphorus removal equipment at Settle and Barnoldswick Wastewater Treatment Works.
- Improvements to Hyndburn Wastewater Treatment Works so that it now meets its consent.
- Reduced ammonia discharges from Blackburn Wastewater Treatment Works.
- Preston Wastewater Treatment Works upgraded and now produces very good effluent.
- Discharging raw sewage at Fairhaven has been stopped.
- Improvements to the sewerage system to resolve problems of combined sewer overflows have been achieved at Walton-le-Dale, Huncoat, Engine Brow, Morris Brow, Kirkham and Ballam Road, Lytham.
- Barley straw used to address the problem of algal blooms in Preston Docks.
- Investigated the discharges from Deerplay Colliery.
- Organised educational visits to farms to prevent pollution from agricultural activities.

Whilst improvements have been achieved there are still issues to be resolved to allow for the continual improvement of water quality in the Ribble area.

Issues Relating to Integrated River Basin Management Identified in this LEAP include:

Issue 3 Adverse Impact of Discharges from Wastewater Treatment Works.

Issue 4 Adverse Impact of Discharges from Combined Sewerage System Overflows.

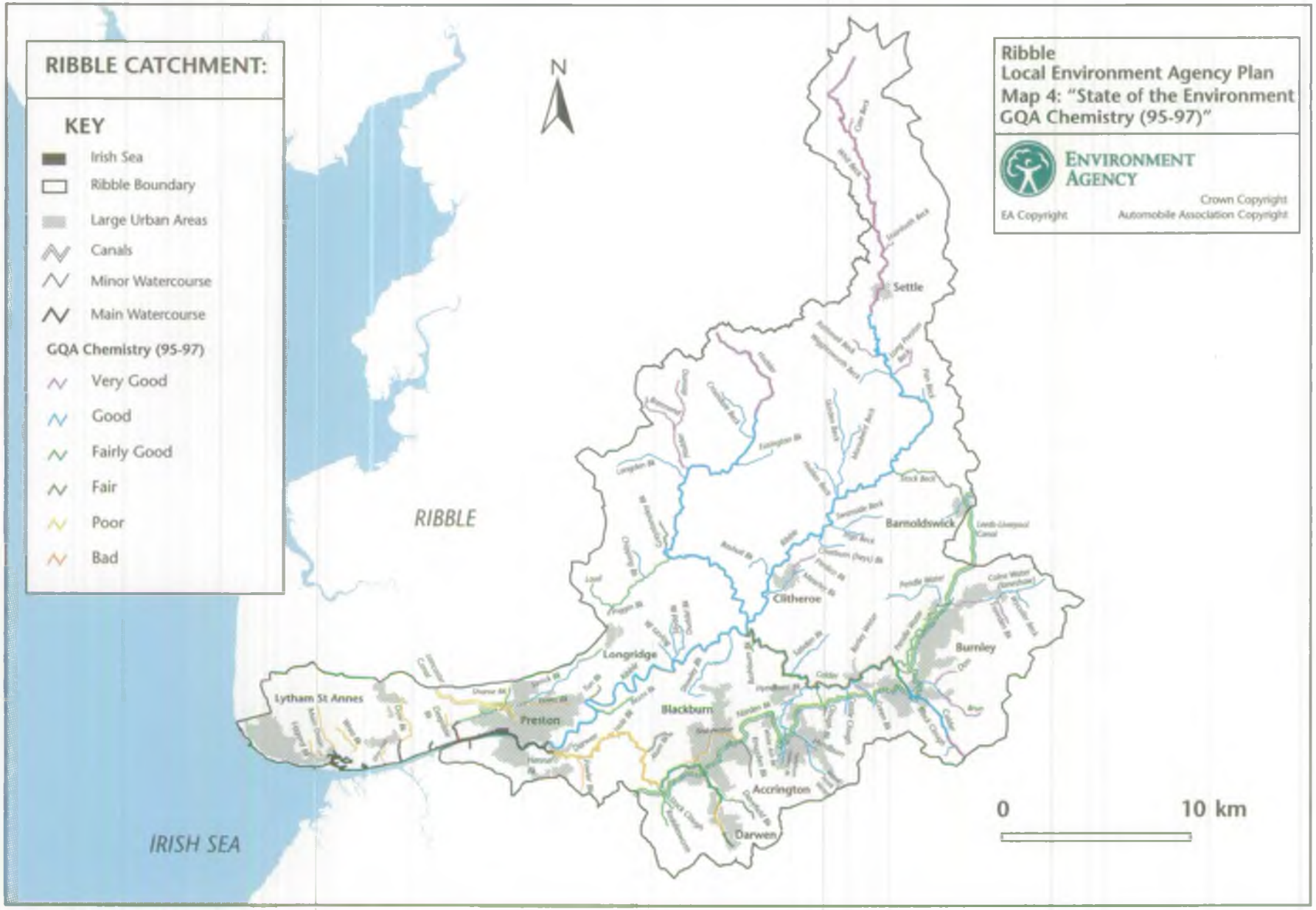
Issue 5 Adverse Impacts of Discharges from Separate Sewerage Systems.

Issue 6 Adverse Impact of Discharges from Stocks Water Treatment Works.

Issue 7 Adverse Impact of Active and Abandoned Mineral Workings within The Ribble Area.

Issue 8 Pollution from Agricultural Activities – The Use of Sheep Dip.

Issue 9	Pollution from Agricultural Activities – The Spreading of Wastes on to Agricultural Land.
Issue 10	Detrimental Enrichment of Waters within the Ribble Area.
Issue 11	Adverse Environmental Impact and/or Risk Associated with Unsewered Rural Communities.
Issue 12	The Failure of Designated Bathing Waters to meet EU Directive Standards, (76/160/EEC).
Issue 13	The apparent lack of maintenance of the river channel of the lower Ribble.
Issue 14	The Development of Savick Brook to form the Ribble Link.
Issue 15	Emergency Response to Extreme Flooding.
Issue 16	Locations at Risk of Flooding within the Ribble Area.
Issue 17	The Strategic Development of River Valley Initiatives in the Ribble Area.


RIBBLE CATCHMENT:
KEY
Irish Sea
Ribble Boundary
Large Urban Areas
Canals
Minor Watercourse
Main Watercourse
GQA Chemistry (95-97)
Very Good
Good
Fairly Good
Fair
Poor
Bad
N
Ribble
Local Environment Agency Plan
Map 4: "State of the Environment
GQA Chemistry (95-97)"
ENVIRONMENT AGENCY
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Crown Copyright
Automobile Association Copyright
RIBBLE
IRISH SEA
Settle
Barnoldswick
Clitheroe
Longridge
Lytham St Annes
Preston
Blackburn
Burnley
Accrington
Darwen
0
10 km

ISSUE 3: ADVERSE IMPACT OF DISCHARGES FROM WASTEWATER TREATMENT WORKS.

Background to the Issue: The sewerage system delivers effluent from domestic properties and industrial premises to Wastewater Treatment Works (WwTW). There it is treated by filtration and/or bacterial breakdown and then discharged into freshwaters, estuaries or directly into the sea. One of the main components of the discharged water is organic matter. Without adequate treatment its decomposition can reduce the amount of oxygen available to fish and other species. In addition suspended solids have the potential to blanket riverbeds and inhibit the breeding of fish. Other components of wastewater can also affect the river quality. These include phosphates, metals and ammonia.

Within the Ribble area discharges from the following Wastewater Treatment Works contribute to problems with water quality see **Map 5**:

- Settle WwTW discharging to the River Ribble.
- Barnoldswick WwTW discharging to Stock Beck.
- Blackburn WwTW discharging to Hole Brook and the River Darwen. This Wastewater Treatment Works is also believed to contribute to unacceptable levels (above the recognised environmental quality standard) of copper in the River Darwen and Ribble Estuary.

Whilst there are some Wastewater Treatment Works that are presently performing well if they operate to their full level of consent it would result in water quality problems downstream. These include:

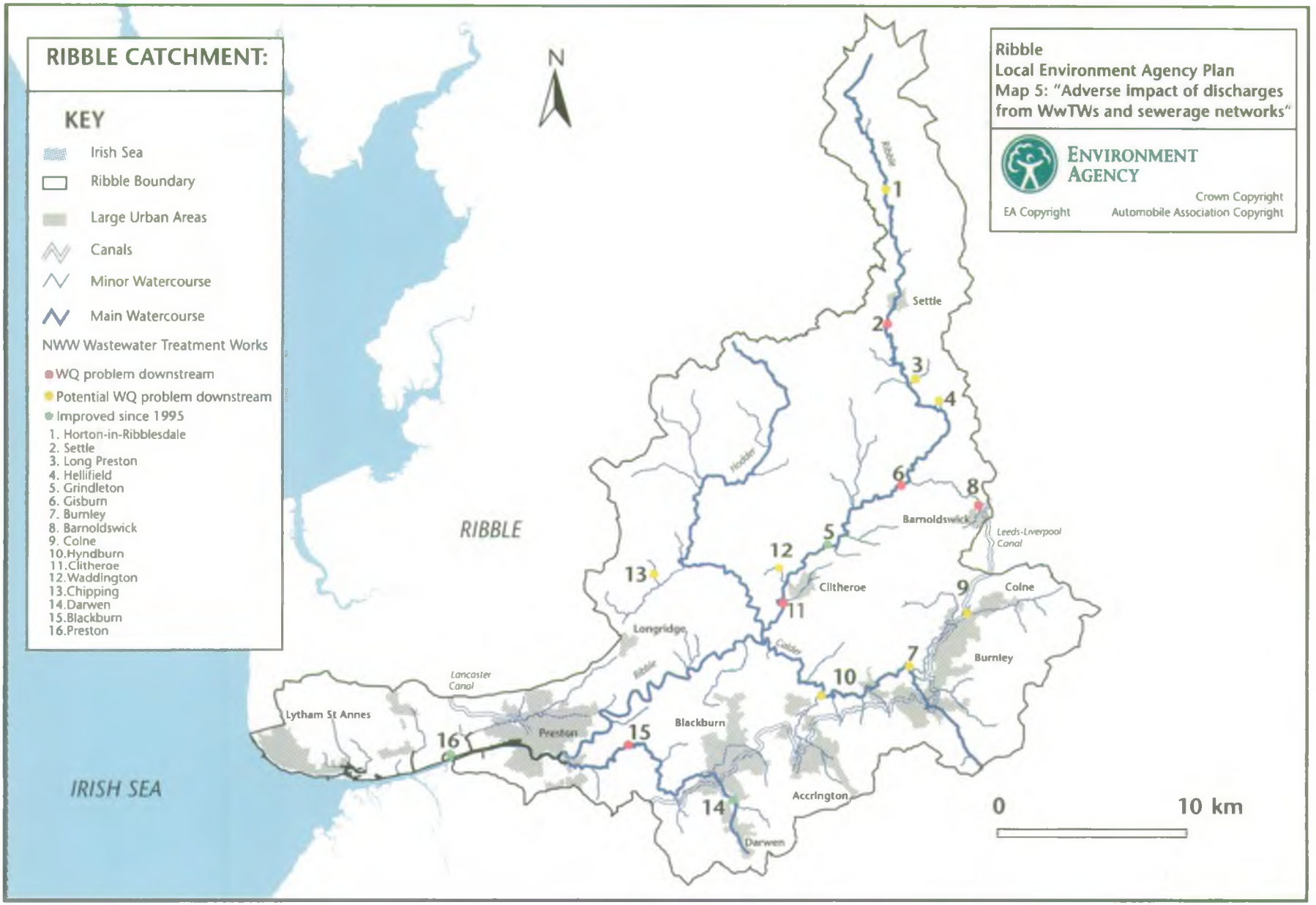
- Horton-in-Ribblesdale WwTW discharging to the River Ribble.
- Waddington WwTW discharging to Bashall Brook.
- Hellifield WwTW discharging to Pan Beck.
- Clitheroe WwTW discharging to the River Ribble.
- Colne WwTW discharging to Colne Water.
- Burnley WwTW discharging to the River Calder.
- Hyndburn WwTW discharging to the River Calder.
- Chipping WwTW discharging to Chipping Brook.

In particular, recent improved effluent quality at Hyndburn WwTW and Burnley WwTW have led to the achievement of fair water quality in the River Calder. Further investment is required at these works to ensure that this quality can be maintained in the long-term.

Possible Solutions: We are involved in identifying and prioritising environmental improvements that are required at Wastewater Treatment Works to achieve water quality objectives. The Department for the Environment, Transport and Regions have recently announced that North West Water Ltd will be required to implement the full programme of improvements proposed by us in the programme referred to as AMP3 (2000-2005). This programme will include improvement works and revised consent standards at all the works identified above.

Solutions	Responsibility	Benefit	Timescale
Installation of additional treatment: eg. Settle WwTW, Barnoldswick WwTW, Blackburn WwTW, Hellifield WwTW, Clitheroe WwTW, Colne WwTW, Burnley WwTW, Hyndburn WwTW.	North West Water Ltd.	Improved water quality, achievement of river quality objectives.	2000-2005.
	The Agency.	Ensure compliance with river quality objectives and prevent deterioration.	2000-2005.
Review consents to prevent deterioration: eg. Horton-in-Ribblesdale WwTW, Waddington WwTW, Chipping WwTW.	The Agency.	Reduce the likelihood of pollution problems occurring in the future.	1999-2002.
Review consent for Blackburn WwTW in line with Agency Dangerous Substances Policy.	The Agency.	Ensure compliance with river quality objectives.	1999-2001.

Constraints: Effectiveness of trade effluent control may make it difficult to reduce the amount of metals entering the Darwen and Ribble estuary.


RIBBLE CATCHMENT:
KEY
Irish Sea
Ribble Boundary
Large Urban Areas
Canals
Minor Watercourse
Main Watercourse
NWW Wastewater Treatment Works
WQ problem downstream
Potential WQ problem downstream
Improved since 1995
1. Horton-in-Ribblesdale
2. Settle
3. Long Preston
4. Hellifield
5. Grindleton
6. Gisburn
7. Burnley
8. Barnoldswick
9. Colne
10.Hyndburn
11.Clitheroe
12.Waddington
13.Chipping
14.Darwen
15.Blackburn
16.Preston
N
Ribble
Local Environment Agency Plan
Map 5: "Adverse Impact of discharges from WwTWs and sewerage networks"
ENVIRONMENT AGENCY
Crown Copyright
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RIBBLE
IRISH SEA
Settle
Barnoldswick
Leeds-Liverpool Canal
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Lytham St Annes
Preston
Blackburn
Accrington
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ISSUE 4: ADVERSE IMPACT OF DISCHARGES FROM COMBINED SEWERAGE SYSTEM OVERFLOWS.

Background to the Issue: Combined sewers are used to convey both foul drainage and uncontaminated surface waters (rain falling on roofs and hard standing areas) to wastewater treatment works. Combined Sewer Overflows (CSOs) are located on sewers or at pumping stations and discharge to local watercourses. When properly designed and constructed they should only operate during storm conditions when there is adequate dilution available in the receiving watercourse.

Historically sewerage systems were of the combined type. Problems now exist due to the increase in residential and commercial development resulting in inadequate sewer capacity and the frequent operation of storm overflows, many of which have inadequate solids retention capability, in 'non-storm' conditions with consequent deterioration in water quality and adverse impact on river aesthetics.

There are presently around 350 Combined Sewer Overflows in the Ribble LEAP area and around 130 of these are presently considered to be unsatisfactory. A number of sewerage improvement schemes have been completed by North West Water Ltd over the past few years (eg. Huncoat, Morris Brow, Engine Brow, Walton-le-Dale, Kirkham and Ballam Road) and further schemes are underway (eg. Nelson, Preston, Blackburn). The remaining Unsatisfactory Combined Sewage Overflows (UCSOs) within the Ribble LEAP area (as of April 1999) are described below.

Due to the intermittent nature of storm overflow discharges, impacts on receiving waters are not always picked up by routine chemical sampling. However, discharges from Combined Sewer Overflows are believed to contribute to the water quality problems listed below:

Water quality problems (failures to meet river quality objectives) highlighted due to regular monitoring:

- **Knuzden Brook and River Blakewater**. Discharges from around 26 Unsatisfactory Combined Sewer Overflows in Blackburn contribute to these failures. Eight of these will be resolved by March 2000.
- **Walverden Water**. Discharges from 12 Unsatisfactory Combined Sewer Overflows in Nelson contribute to this failure. These will be resolved by July 1999.
- **Savick Brook and Eaves Brook**. Discharges from around eight Unsatisfactory Combined Sewer Overflows in the Lea Gate area of Preston contribute to these failures. These will be resolved by March 2000.
- **Ribble Estuary**. This suffers from poor bacteriological quality. Between 35 and 40 Unsatisfactory Combined Sewer Overflows discharge either directly or indirectly via tributaries such as Chain Caul Culvert to the Ribble Estuary in Preston.
- **River Darwen**. Discharges from around eight Unsatisfactory Combined Sewer Overflows in Darwen contribute to this failure.
- **River Roddlesworth**. Discharges from the Abbey Village pumping station contribute to this failure.

- Dow Brook and Wrea Brook. Discharges from four Unsatisfactory Combined Sewer Overflows in the Fylde area contribute to these failures.

Other water quality problems:

- Four Unsatisfactory Combined Sewer Overflows in the Burnley area discharging to the River Calder. These contribute to poor aesthetics in the river.
- Two Unsatisfactory Combined Sewer Overflows discharging to Bezza Brook and Mellor Brook.
- Three Unsatisfactory Combined Sewer Overflows discharging directly or indirectly to Stock Beck in Barnoldswick.
- Two Unsatisfactory Combined Sewer Overflows discharging to Swinden Clough in Colne.
- Five Unsatisfactory Combined Sewer Overflows discharging to tributaries of Pendle Water in the Brierfield area.
- Two Unsatisfactory Combined Sewer Overflows in the Settle area discharging directly or indirectly to the River Ribble.
- Eight Unsatisfactory Combined Sewer Overflows in the Hyndburn area discharging to Hyndburn Brook and its tributaries.
- Two South Ribble Unsatisfactory Combined Sewer Overflows discharging to the River Darwen.

There is a general problem with sewage litter discharged from Combined Sewer Overflows into the River Calder, the River Darwen and the Lower River Ribble. The provision of screening of Combined Sewer Overflow discharges will form part of the solution for these Unsatisfactory Combined Sewer Overflows.

Solutions	Responsibility	Benefit	Timescale
Post-scheme monitoring and appraisals of recently completed schemes, eg. Huncoat, Morris Brow, Engine Brow, Walton-le-Dale, Leyland/Bannister Brook, Ballam Road.	The Agency.		1999-2001.
Ensure resolution of Unsatisfactory Combined Sewer Overflows within present AMP2 programme:	North West Water Ltd. The Agency.	Reduction in the number of unsatisfactory CSOs by capital works. Improved water quality. Improved aesthetic quality.	1999-2000.
eg. Blackburn phase 1 Nelson Lea Gate.			
Resolution of outstanding UCSOs during AMP3.	The Agency. North West Water Ltd.	Prevent deterioration in water quality.	
Apply development control restrictions until completion of sewerage schemes, eg. Blackburn.	The Agency. Local planning authorities.	Prevent deterioration in water quality.	Prioritised AMP3 programme by October 1999. Resolution within 2000-2005.

ISSUE 5: ADVERSE IMPACTS OF DISCHARGES FROM SEPARATE SEWERAGE SYSTEMS.

Background to the Issue: Modern developments have separate sewerage systems for dealing with uncontaminated surface water run-off and foul sewage. Clean water is piped and discharged to a local watercourse and the foul sewage is conveyed to a Wastewater Treatment Works (WwTW).

The advantages of this network compared to the traditional combined sewerage system are the elimination of the need for storm sewage overflows and the reduced treatment costs due to the smaller volumes treated.

However, problems arise where foul water is incorrectly plumbed to the surface water system (eg. from household washing machines) or where contaminated liquids are poured down surface water drains instead of drains connected to the foul sewer. This leads to Contaminated Surface Water (CSW) or 'Wrong Connection' problems.

The Agency in conjunction with North West Water Ltd and the local authorities carry out site inspections to identify CSW problems. These visits allow site occupiers to be made aware of the impact on water quality and to rectify any problems.

A review of contaminated surface water discharges from North West Water Ltd surface water outfalls was carried out in 1997 and a prioritised list of Contaminated Surface Water problems in the North West Region was produced. Around 300 problems were identified and of these around the top 60 have been selected as being of high priority and these problems are currently being investigated. The remaining problems have been highlighted by the Agency for resolution during the AMP3 period, 2000-2005.

The Contaminated Surface Water problems that are located within the Ribble area are listed below:

High Priority Sites.

- **Parklands, Penwortham** – outfall discharging to a tributary of the River Ribble Estuary.
- **Lammack and Beardwood Estates, Blackburn** – three outfalls discharging to tributaries of Arley Brook.

Lower Priority Sites.

- **The Goit, Padiham** – outfalls discharging to a tributary of the River Calder.
- **Warton** – outfall discharging to Wrea Brook. Discharges in Wrea Brook.
- **Reedley Allotments, Burnley** – outfall discharging to a tributary of the Leeds-Liverpool Canal.
- **Norfolk Avenue, Hapton** – outfall discharging to Shaw Brook.
- **Lower Manor Lane, Burnley** – two outfalls discharging to a tributary of Pendle Water.

Solutions	Responsibility	Benefit	Timescale
Resolution of high priority Contaminated Surface Water problems by investigating sewer connections and remedying problems found.	North West Water Ltd, Agents, Environmental Health, Householders, The Agency.	Improved water quality and aesthetics following resolution of CSW problems.	1999-2000.
Resolution of outstanding Contaminated Surface Water problems in AMP3.	North West Water Ltd, Agents, Environmental Health, Householders, The Agency.	Improved water quality and aesthetics following resolution of CSW problems.	2000-2005.

Constraints: Costs and Resources for North West Water Ltd/Local Authorities/Householders.

ISSUE 6 ADVERSE IMPACT OF DISCHARGES FROM STOCKS WATER TREATMENT WORKS.

Background to the Issue: Stocks Reservoir is a major source of drinking water in the area. The treatment of raw water for drinking water generates a significant amount of sludge. This sludge has historically been disposed of in landfill areas located on the site adjacent to the River Hodder and Phynis Beck. Due to the nature of the Hodder area and the chemicals used on site the sludge contains elevated levels of metals such as aluminium, iron, lead and copper.

Uncontrolled discharges from the landfill areas are presently being made to the River Hodder and to a lesser extent to Phynis Beck. These discharges cause a localised aesthetic impact and have the potential to lead to exceeding the environmental quality standards in the river downstream. A cut-off drain has now been provided in order to enable better monitoring to be undertaken of the discharges from the larger of the landfill areas. A reed bed treatment system has been proposed to improve the quality of these discharges. We have recently consented these discharges. Sludge presently generated on the site is now being disposed of off-site and North West Water Ltd are investigating methods of restoration for the closed landfill areas.

Possible Solutions:

Solutions	Responsibility	Benefit	Timescale
Provision of treatment, eg. reed bed, for discharges from the landfill site.	North West Water Ltd.	Improved aesthetics and water quality.	2000.
Restoration of landfill area.	North West Water Ltd.	Reduced infiltration into old landfill area.	2000-2004.

ISSUE 7: ADVERSE IMPACT OF ACTIVE AND ABANDONED MINERAL WORKINGS WITHIN THE RIBBLE AREA.

Background to the Issue: When water runs through a disused mine or spoil heaps it picks up chemicals and becomes polluted. The most common sign of pollution is an ochre discolouration of the water due to iron. Some polluted waters have a characteristic 'rotten egg' smell and accompanying white deposit on the bed of the watercourse, this indicates pollution from sulphides.

This type of pollution not only makes the rivers and streams less attractive it is also harmful to wildlife.

In East Lancashire there are several abandoned mines that require some action to ensure that they do not cause any pollution. These are listed below:

- **Deerplay Colliery** – minewater discharges into Black Clough at Cliviger, near Burnley, which also affects the River Calder. It is included in the list of the top ten priority sites within England, and consultants engaged by the Coal Authority are currently carrying out detailed investigations. Due to the complicated hydrology, construction of remedial works is unlikely to commence before 2000-2001.
- **Hapton Valley Colliery** – minewater and colliery spoil leachate discharging into tributaries of Green Brook, Hapton. This is included in the national list of minewater problems.
- **Aspden Valley Colliery, Oswaldtwistle** – minewater discharge to White Ash Brook. This is included in the national list of minewater problems.
- **Woodend Colliery** – minewater discharge to Pendle Water near Burnley.
- **Coal Pit** – minewater discharge to Copy Clough/Everage Clough, Burnley.
- **Calder Colliery** – minewater discharge to the River Calder at Altham.
- **Horton-in-Ribblesdale** – impacting on Whit Beck.

Along with those listed above there are also significant minewater discharges to the following watercourses: Church Clough at Colne, Lottice Brook at Oswaldtwistle and Woodnook Water at Baxenden.

Possible Solutions: These problems can be solved. A good example is the colliery spoil heap at Rowley in Burnley. This had a serious polluting effect on the River Brun, but in 1997 discharges from the heap were terminated following remedial work carried out by Lancashire Waste Services Ltd who operate the adjacent landfill site. Water quality and aesthetics have improved significantly since these discharges were intercepted.

We are continuing to monitor the effects of the above minewater discharges.

Solutions	Responsibility	Benefit	Timescale
Interception and treatment of discharges, eg. Deerplay.	Coal Authority.	Improved water quality and aesthetics.	2000-2001.
Removal of old mining deposits, eg. Horton-in-Ribblesdale.	?	?	?
Reintroduction of pumping to prevent contamination.	?	?	?

ISSUE 8: POLLUTION FROM AGRICULTURAL ACTIVITIES – THE USE OF SHEEP DIP.

Background to the Issue: In 1996, a serious pollution incident was detected on the River Ribble near Selside, which affected more than 20km of the river. Although no fish appeared to have been killed, the effect was serious on the invertebrate life in the Ribble for some time after. Other less serious problems have been detected on the Rivers Laneshawe/Colne and Langden Brook, near Dunsop Bridge. These pollution incidents have involved synthetic pyrethroid chemicals that are found in some sheep dips.

Sheep dips containing synthetic pyrethroid chemicals are being used more frequently as they are safer for the operators. However, they can be more than a hundred times more toxic to the water environment than organo-phosphate sheep dips.

Possible Solutions: We have started an awareness raising campaign in the Ribble, Wharfe and Aire areas, in partnership with our North East Region colleagues. The campaign has involved giving presentations to groups of farmers and landowners. Staff at the Agency have received training in the application of sheep dips in order to understand the difficulties facing farmers.

Solutions	Responsibility	Benefit	Timescale
Awareness raising campaign in the Ribble, Wharfe and Aire areas to lessen use of Synthetic Pyrethroid sheep dips.	The Agency (NW and NE Regions), Farmers, NFU.	Develops good working relationships. Reduce problem at source.	Commenced 1999 and is on going.

ISSUE 9: POLLUTION FROM AGRICULTURAL ACTIVITIES – THE SPREADING OF WASTES ON TO AGRICULTURAL LAND.

Background to the Issue: Agricultural activity is extensive throughout the Ribble area. The uplands above Settle and the Trough of Bowland are largely sheep farming areas with dairy farming predominating on the lower river. Some of the upland farms are located on permeable limestone so that spillage's and other releases of pollutants to ground can enter groundwater quickly and can sometimes re-emerge some kilometres away causing problems in surface waters. Such pollutions are often very difficult to track down and prevent.

Diffuse pollution from agricultural land associated with cultivation, silt run-off fertiliser usage and spreading of animal slurries can result in pollution and is believed to contribute to water quality problems at a number of locations, see below:

- River Hodder
- Skirden Beck and Monument Beck
- Liggard Brook and Main Drain
- Wigglesworth Beck
- River Loud
- Langden Brook
- Swanside Beck
- Dow Brook
- Wrea Brook
- Greystoneley Brook
- Sabden Brook
- Croasdale Beck
- Easington Brook
- Arley Brook
- Holden Beck
- Ings Beck
- Pool Stream
- Deepdale Brook

The problem is compounded by the fact that the Ribble area has predominantly clay soils, which waterlog quickly thus producing difficulty in disposing of farm waste, especially after spells of wet weather. Slurry spread on wet land, especially when sloping, can readily enter watercourses.

Within the Ribble area there is also a problem of farmers spreading waste on the land. Whilst there are laws to prevent wastes being dumped on to the land, there are some wastes and activities that are exempt. These include the spreading of paper sludge and abattoir waste for the benefit of agriculture or ecology. These exemptions create a 'grey area' where some spreading of waste onto land is carried out where it is inappropriate and this leads to pollution incidents.

This issue is particularly relevant to the Ribble area, as it appears to suffer from more pollution incidents of this type than other LEAP areas. This maybe due to large volumes of waste being produced by local industries, including the relatively intense dairy production systems that operate in the area. The pollution incidents and the areas that were affected are listed below:

- **Clitheroe, Hapton, Longridge and Hyndburn.** Water pollution incidents due to run-off after inappropriate spreading.
- **Grindleton.** Polluting run-off from stockpiled paper sludge.
- **Hyndburn and Bowland.** Over-application of wastes causing degradation of ecological quality.
- **Great Harwood and Grindleton.** Application of wastes have left the area unsightly and suffering from bad smells.
- **Hodder sub-area.** Recent decline in the ecological quality of some watercourses is thought to be due to diffuse pollution from landspreading of agricultural wastes.

Another reason why it is important to address this issue is because the spreading of sewage sludge to land could increase following the banning of off shore dumping in 1998.

The practice of spreading waste onto land as a cheap means of disposal with no agricultural or ecological benefit is unacceptable. The above incidents demonstrate that we need to establish the level at which the spreading of waste on to the land benefits agriculture or ecology yet does not pollute local watercourses.

Solutions	Responsibility	Benefit	Timescale
Promote good practice in spreading slurry and exempt wastes on to the land.	The Agency, Farmers, NFU.	Reduce pollution incidents occurring.	2000-2004.
Monitoring selected sites before and after the spreading of waste on the land.	The Agency.	Identify changes caused by this type of pollution to plant and animal life, soil structure and chemistry and surface and groundwater quality.	2000-2004.
Promote Farm Management Plans including storage solutions.	The Agency, Farmers, Landowners, Agricultural Contractors.	Reduction of pollution.	2000-2004.
Promote Buffer Strips.	The Agency, Farmers, Landowners, Agricultural Contractors.	Reduction of pollution and have a good example with the Sustainable Rivers Project.	2000-2004.

ISSUE 10: DETRIMENTAL ENRICHMENT OF WATERS WITHIN THE RIBBLE LEAP AREA.

Background to the Issue: Several stretches of water within the Ribble area are affected by excessive growths of algae. This is because the algae thrive on extra nutrients, which are being discharged into the water from Wastewater Treatment Works and agricultural land.

As the algae thrive they can take the place of more sensitive species such as Water Crowfoots. Excessive algae can lower the level of dissolved oxygen and increase the alkalinity of the water making it difficult for many animals, including fish to survive. When water is in this state it is said to be eutrophic.

The enrichment of waters has also meant that several stretches of water fail to meet European standards or River Ecosystem river quality objectives. These include:

- Lower reach of the River Ribble fails to comply with the European Freshwater Fish Directive pH standard.
- The fifth milepost in the Ribble Estuary fails to comply with the European Dangerous Substances Directive pH standard.
- River Ribble below Settle WwTW fails to comply with its river quality objective.
- River Ribble below its confluence with Stock Beck fails to comply with its river quality objective.

Excessive nutrients in the water can also lead to toxic blue green algal blooms. Such blooms have appeared in the Leeds-Liverpool Canal in the Nelson area, (introduced by the reservoirs at Barrowford and Foulridge that feed the Canal), and in Preston Docks. This poses a health hazard to anyone using the water for recreational activities and can look unattractive.

We will be in a good position to identify particular Wastewater Treatment Works discharges that lead to excessive nutrients entering watercourses due to the monitoring that is now required under the Urban Waste Water Directive. Waters identified as suffering from excessive nutrients, following the monitoring exercise, can be designated as sensitive (eutrophic) areas. Discharges that carry wastewater from a population of over 10,000 will then need to ensure that nutrient levels are kept to within allowable levels.

Areas within the upper Ribble are already benefiting from this Directive as nutrient removal equipment has recently been installed at Settle and Barnoldswick Wastewater Treatment Works to reduce the levels of phosphorus discharged into the river.

We have identified three other North West Water Ltd Wastewater Treatment Works (Clitheroe WwTW, Burnley WwTW and Hyndburn WwTW) as requiring nutrient removal equipment. Nutrient removal will be required at these works by 2004.

Solutions	Responsibility	Benefit	Timescale
Monitor effects of reduced phosphorus loads discharged from Settle WwTW and Barnoldswick WwTW.	The Agency.		1999-2001.
Provide nutrient removal at Clitheroe WwTW, Burnley WwTW and Hyndburn WwTW.	North West Water Ltd.	Reduction in nutrient loads discharged and achievement of river quality objectives.	2004.
Monitoring of Pendle Water and the River Calder with a view to also designating these waters as sensitive (eutrophic) areas in the future.	The Agency.	Improved water quality and aesthetics in the Docks.	2001.
Trial use of barley straw in Preston Dock.	Local Authority and the Agency.	Improved water quality and aesthetics in the Docks. Reduced health risks. Use of Docks for recreation. Information gathered during the trial could be used elsewhere.	Introduce Barley straw early 1999 and replace at regular intervals.

Constraints: For Preston Docks – Cost and resources to maintain trial over next few years. Benefits of nutrient removal may not be immediate due to phosphorus stored in sediments.

ISSUE 11: ADVERSE ENVIRONMENTAL IMPACT AND/OR RISK ASSOCIATED WITH UNSEWERED RURAL COMMUNITIES.

The Issue: Discharges from homes that are not connected to the sewerage network are causing stretches of poor water quality in rural areas.

Background to the Issue: In some rural areas where there are only a few dozen properties or less, a public sewer may not be available. Where there is no provision of a foul sewer, then it is the responsibility of the homeowner to provide a facility such as a septic tank. This then discharges to a soakaway or to the nearest watercourse and this may lead to water quality problems.

Some modern facilities, such as 'Package Sewage Treatment Plants', generally have a higher level of biological treatment and can produce good quality effluents if correctly used and maintained. Septic tanks usually produce worse effluents than Sewage Treatment Plants and should not be connected directly to a watercourse. The problem can become acute in certain rural areas where a cluster of houses all discharge into the same local watercourse. Here, water quality can be badly affected even when the individual sewage treatment plant may be working satisfactorily.

Under certain circumstances North West Water Ltd has a duty to provide homeowners with sewerage facilities, where it is deemed appropriate and cost effective. However, in many cases it will be very costly to install new pipes and pumping stations due to their rural location. It is also the responsibility of the homeowner to approach North West Water Ltd and to state their case. This system makes it difficult for rural homeowners to gain connection to the sewerage network and water quality suffers because of this.

Locations where water quality problems are known to exist are listed below:

- Wrea Brook
- Mitton, near Blackburn
- Thornley near Preston
- Hesketh Lane, Chipping
- Newton, Preston
- Fulwood Row, Preston
- Moss Side, Lytham St Annes
- Worston Old Hall, The Byre
- Southfield, Burnley
- Boltons Croft, Preston
- Pendle Trading Estate, Chatburn
- Deepdale Brook
- Paythorne and Withgill near Clitheroe
- Inglewhite Road, Longridge
- West Bradford Road, Waddington
- Warton near Preston
- Leagram, Preston
- Westby, Preston
- Foulridge and Salterforth, Colne
- Treales, near Preston
- Bracewell, near Barnoldswick

Solutions	Responsibility	Benefit	Timescale
Provision of first time sewerage facilities. eg. Worston Old Hall.	North West Water Ltd/ Householders/ Local Authorities.	Improved local water quality.	Ongoing – in response to applications.
Improvement of existing treatment facilities.	Householders. The Agency.	Improved local water quality.	
Liaise with Planning Authority to make them aware that new development in certain areas could adversely affect water quality due to inadequate sewerage facilities.	The Agency, Local Authorities.	Prevents pollution problem from occurring.	

Constraints: Householders may be reluctant to pay sewerage/connection charges.

ISSUE 12: FAILURE OF DESIGNATED BATHING WATERS TO MEET EU DIRECTIVE STANDARDS.

The Issue: We play an important role in the implementation of the EC Bathing Water Directive. In addition to being responsible for the sampling and monitoring of bathing waters we have duties and powers to control discharges to controlled waters with respect to water quality objectives. We are working in partnership with North West Water Ltd to investigate and implement measures to ensure that the bathing waters around Lytham St Annes reach a good clean standard. The issue of concern is that despite the recent completion of a number of major improvements, by North West Water Ltd, these waters presently fail to comply with bathing water standards, as can be seen on **Map 6**.

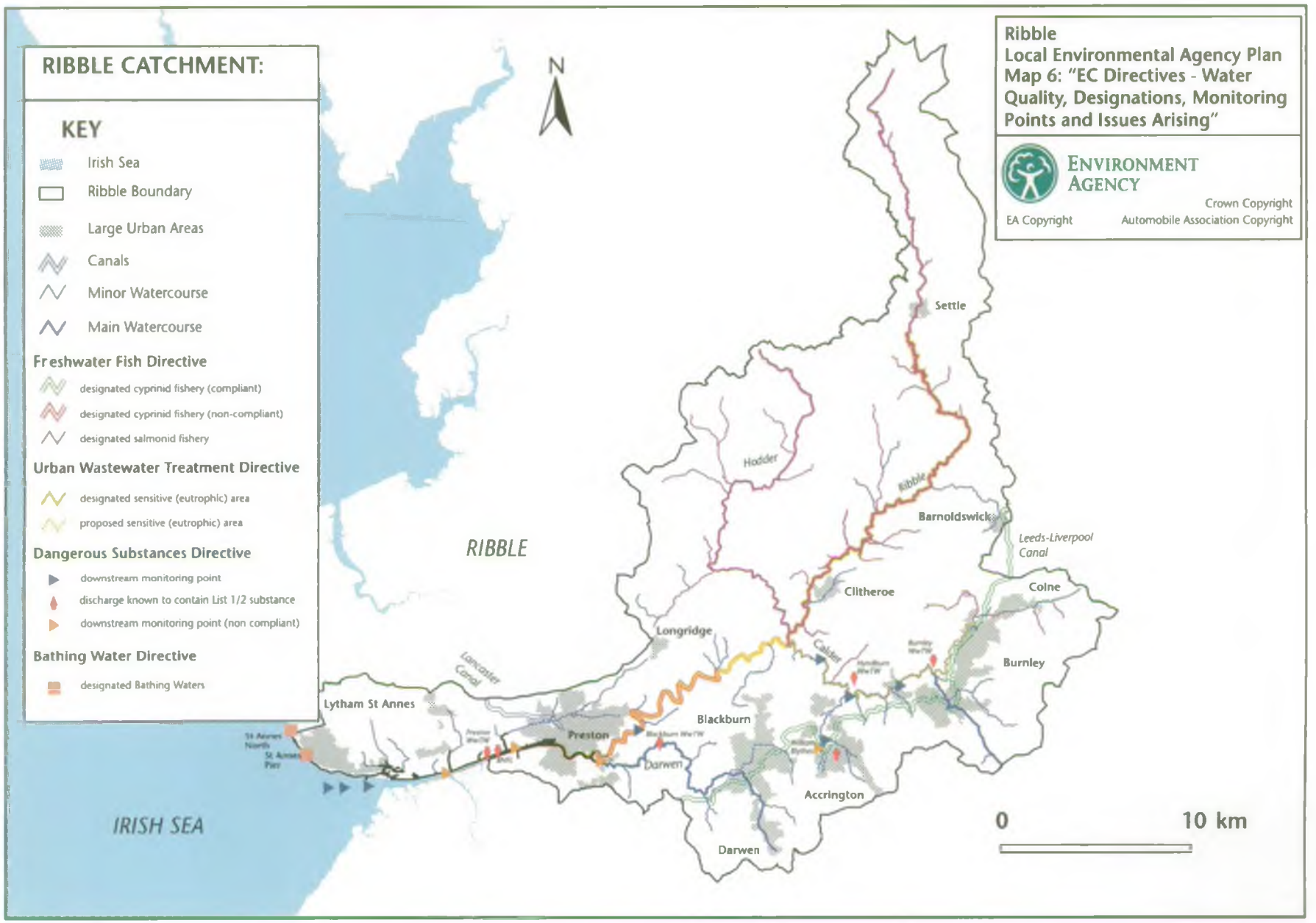
Background to the Issue: The two beaches at Lytham St Annes are designated as bathing waters under the EC Bathing Waters Directive. North West Water Ltd have already spent millions of pounds improving effluent quality by installing secondary treatment at Preston and Southport Wastewater Treatment Works and by eliminating crude sewage discharges such as those at Fairhaven. It was originally anticipated that completion of these schemes would achieve the bathing water standards at the two beaches at Lytham. A series of further temporary measures were introduced in 1998. These included the use of chlorination at Southport Wastewater Treatment Works, chlorination of storm sewage discharges from Fairhaven and Lytham pumping stations and chemical dosing to improve settlement of storm discharges at Preston Wastewater Treatment Works. Whilst improved bathing water quality was observed at other sites during 1998, bathing water quality at Lytham did not improve.

It is not understood what is exactly causing these waters to fail the standards. It is a very complex issue to understand and a very costly issue to put right. The quality of the bathing water is variable. It is affected by the quality of the Ribble Estuary, which itself is variable depending on the time of year and weather conditions. There is also the influence of the Irish Sea to be taken into account. An example of the unpredictable nature of this issue are the cases during 1997 and 1998, when periods of particularly poor bathing water quality coincided with extreme tidal conditions and significant amounts of animal faeces were deposited on the beaches. The origins of this faecal matter are at this moment unknown and investigations into this are on going.

Possible Solutions: Further long term permanent solutions such as the provision of UV disinfection and additional storage facilities to reduce the frequency of discharges of storm sewage are presently being implemented for the 1999 bathing season. Some improvement works (eg. provision of additional storage at Southport Wastewater Treatment Works, improvements at Wigan Wastewater Treatment Works) have been put on hold pending the completion of further studies. A project to construct a mathematical model of the Ribble Estuary has recently been jointly commissioned by North West Water Ltd and us. We also intend to undertake further associated monitoring work during 1999.

Solutions	Responsibility	Benefit	Timescale
Provision of UV disinfection at Preston WwTW and Southport WwTW.	North West Water Ltd.	Reduction in bacteriological load discharged to the Ribble Estuary.	1999.
Provision of further storage to reduce discharges of storm sewage from Fairhaven pumping station, Preston WwTW and Lytham pumping station.	North West Water Ltd.	Reduction in bacteriological load discharged to the Ribble Estuary.	1999.
Construction of a mathematical model of Ribble Estuary.	The Agency/ North West Water Ltd.	Provide a tool for examination of the problem.	1999.
Investigation into other factors contributing to poor water quality (eg. agricultural inputs).	The Agency.	Provide information to inform our view on the review of consents under the habitats directive.	1999.

Constraints: Large variability in bathing water quality and large number of influencing factors.


RIBBLE CATCHMENT:
KEY
Irish Sea
Ribble Boundary
Large Urban Areas
Canals
Minor Watercourse
Main Watercourse
Freshwater Fish Directive
designated cyprinid fishery (compliant)
designated cyprinid fishery (non-compliant)
designated salmonid fishery
Urban Wastewater Treatment Directive
designated sensitive (eutrophic) area
proposed sensitive (eutrophic) area
Dangerous Substances Directive
downstream monitoring point
discharge known to contain List 1/2 substance
downstream monitoring point (non compliant)
Bathing Water Directive
designated Bathing Waters
N
RIBBLE
IRISH SEA
Ribble
Local Environmental Agency Plan
Map 6: "EC Directives - Water Quality, Designations, Monitoring Points and Issues Arising"
ENVIRONMENT AGENCY
Crown Copyright
EA Copyright
Automobile Association Copyright
Settle
Hodder
Ribble
Barnoldswick
Leeds-Liverpool Canal
Clitheroe
Colne
Longridge
Burnley
Lancaster Canal
Lytham St Annes
Blackburn
Preston
Darwen
Accrington
Darwen
0
10 km

ISSUE 13: THE APPARENT LACK OF MAINTENANCE OF THE RIVER CHANNEL OF THE LOWER RIBBLE.

The Issue: Following the closure of Preston Docks, there is no clear evidence of maintenance of the training walls along the tidal section of the River Ribble or the river channel.

Background to the Issue: On the closure of Preston Docks, responsibility for maintaining the river channel is unclear. Maintenance would not appear to have been carried out and roles and responsibilities need to be clarified.

Since the docks closure, over 15 years ago, there has been no dredging. As a consequence of this a build up of silt may occur that could render ineffective some gravity outfalls to the estuary making pumping necessary. There is also a possibility that through lack of maintenance the training walls could start to break up. This could lead to meandering of the channel with the threat of erosion of the present sea defence works and of flooding of the reclaimed Grade 1 agricultural land which forms a considerable part of the estuary. Other possible adverse effects include deterioration in water quality and fishery interests.

At the present time navigational use of the channel of the River Ribble is minimal. However, there is a proposal to extend the Lancaster Canal to the River Ribble via Savick Brook. It may be possible to include maintenance of the Ribble channel downstream of Savick Brook in the Navigation especially as the Canal will be wholly dependent on using the River Ribble as a link to be viable.

Possible Solution: An investigation is required to decide what maintenance actions are required to keep the docks and the Ribble in a good and safe condition.

Solutions	Responsibility	Benefit	Timescale
Carry out investigation.	Shoreline Management Plan Partnership.	To determine if works are required.	2000-2001.
Carry out remedial works. as required.	Appropriate body.	Maintain the Navigation channel of the River Ribble.	
Continue to monitor the situation.	Ribble Estuary Shoreline Management Plan Partnership.	Ensure siltation is dealt with.	
Pass Responsibility to BWB.	BW as part of 'Ribble Link' Canal.	Maintenance of Navigation for Navigation by a Canal Board.	

Constraints: Availability of funds within Local Authority and the Flood defence budgets.
Difficulty in identifying riparian owners.
Riparian owners ability to fund any necessary works.

ISSUE 14: THE DEVELOPMENT OF SAVICK BROOK TO FORM THE RIBBLE LINK

The Issue: The design and build of the Ribble Link must be optimised to prevent harm to the environment and realise recreational and ecological benefits.

Background to the Issue: The Ribble Link Trust proposed to build a link between the Lancaster Canal and the River Ribble. The benefit of creating a navigable link between the Ribble estuary and the Lancaster Canal is that it will allow boats to enter the Leeds-Liverpool canal. This increases the length of navigable watercourse in the area and could result in increased recreational tourism in the region.

The Ribble Link Trust has gained planning permission to build a canal along part of the length of Savick Brook. Since the water quality of Savick Brook is currently classed as poor we consider that the new link would have an unacceptable water quality due mainly to discharges from combined sewage overflows.

However, North West Water Ltd are committed to carrying out a series of improvements to the Preston Sewerage System that over the next six years will result in fewer discharges from combined sewage overflows. In addition new modelling work and a planned narrower canal carrying less water has convinced us that the water quality of the link will be acceptable by 2005. The creation of the link still leaves six major questions that need to be answered:

1 How will the function of Savick Brook as a conduit for floodwaters and other flood prevention measures be protected?

2 How will the ecological, recreational and fisheries uses of the canal be optimised?

3 How will water resources be managed to allow the link to be used but with no environmental impact?

4 How will the canal be designed and built to minimise pollution?

5 How will the water quality issues, after construction and filling, be dealt with until North West Water Ltd carries out all the planned improvement works?

6 How will any discharges from combined sewage overflows be dealt with following completion of the improvements by North West Water Ltd?

Solutions	Responsibility	Benefit	Timescale
1a. Protection of Flood Defence standards at the design stage.	The Agency, Ribble Link Trust, British Waterways.	Protection of local people from flood risk.	
1b. Agreed maintenance regime.	British Waterways , Ribble Link Trust.	Protection of local people from flood risk.	
2. Inclusion of ecological, recreational and fisheries enhancement at the design stage.	Ribble Link Trust, The Agency.	Maximise the benefits for wildlife and recreational opportunities for people.	
3. Undertake study of the water resources and produce management plan for the Lancaster Canal, the Ribble Link and the Douglas link to the Leeds-Liverpool Canal.	British Waterways, Ribble Link Trust, The Agency.	Gain a better understanding of water resources and gain the best use of lockages. Help to protect low flow areas in the Rivers Wyre and Douglas.	
4. Develop a multi-functional group led by the local Environmental Protection Team to oversee construction.	The Agency, Construction Company.	Identify and implement good practice to minimise pollution during construction.	
5. Identify management methods for dealing with discharges from combined sewer overflows prior to completion of North West Water Ltd's improvement works.	British Waterways, Ribble Link Trust, The Agency.	Protection of wildlife.	
6. Identify management methods for dealing with discharges from combined sewer overflows following completion of North West Water Ltd's improvement works.	British Waterways, Ribble Link Trust, The Agency.	Protection of wildlife.	

ISSUE 15: EMERGENCY RESPONSE TO EXTREME FLOODING.

Issue: We aim to warn people about flooding to a standard of 1 in 50 years. However, what happens if a flood exceeds this standard?

Background to the Issue: Historically, many towns and villages have been sited on the flat, low lying and fertile land adjacent to rivers – the floodplain. Potentially, anyone who lives in a floodplain is at risk of flooding. The Agency, local authorities and others do carry out works to minimise the risk of river and tidal flooding by carrying out maintenance or constructing new flood defences.

Flood defences throughout the catchment provide a reasonable standard of protection to properties outside the formal zones and areas at risk of frequent flooding (see Issue 16) However, if works to alleviate flooding are carried out, there remains a residual risk of flooding should there be a breach of the defence or should the defence be overtopped by a flood event greater than the design standard.

By defining lengths, or reaches, with common land use those flood risk areas with a high population concentration can be treated as a priority in identifying arrangements for a co-ordinated Emergency Response to extreme flooding, see **Map 7**.

Fluvial Locations	**Tidal Locations**
Pendle Water, Barrowford and Nelson	St. Anne's
Colne Water, Colne	Lytham
River Calder, Burnley	
Blake Water, Blackburn	
River Darwen, Blackburn	
River Darwen, Walton-Le-Dale	

We take the lead and co-ordinating role in warning people of flooding who live in the Agency's formal flood warning zones so that they can take action to protect themselves and their property in the event of flooding. The dissemination of information is in partnership with other organisations including the Local Authorities, Emergency Services and local media. Arrangements for the provision of warnings are established in these formal flood risk zones. Nevertheless it is possible for properties close to these predefined areas to be subject to flooding during an extreme flood. Emergency Response arrangements to extreme flooding in the formal flood warning sites need to be reviewed. Arrangements also need to be reviewed for areas that are classified as informal flood warning zones. In these zones we alert the local authorities. There is no direct contact between the Environment Agency and members of the public. Such procedures are in operation at Low Moor in Clitheroe, the Oxford Road area of Burnley and Penwortham in Preston.

Possible Solutions: The Environment Agency commissioned an external report, which investigated the problems that arose during the flooding at Easter 1998. From this report a series of recommendations and actions were formed which the Environment Agency is currently instigating and/or implementing.

1 Improve the rainfall and river flow stations in number, location and design for flood monitoring and forecasting and improve provision of river level and other catchment data during extreme floods for key points upstream of urban areas, to measure extreme river levels.

2 A standard definition of a major flooding incident to be adopted by the Agency and recognised by all organisations involved in the emergency response to flooding.

3 Agency to ensure that major flooding event scenarios are included for consideration in local joint agency exercise programmes.

4 Target people in areas at lower flood risk through general awareness advertising and publicity information in public libraries, council offices and other public access points.

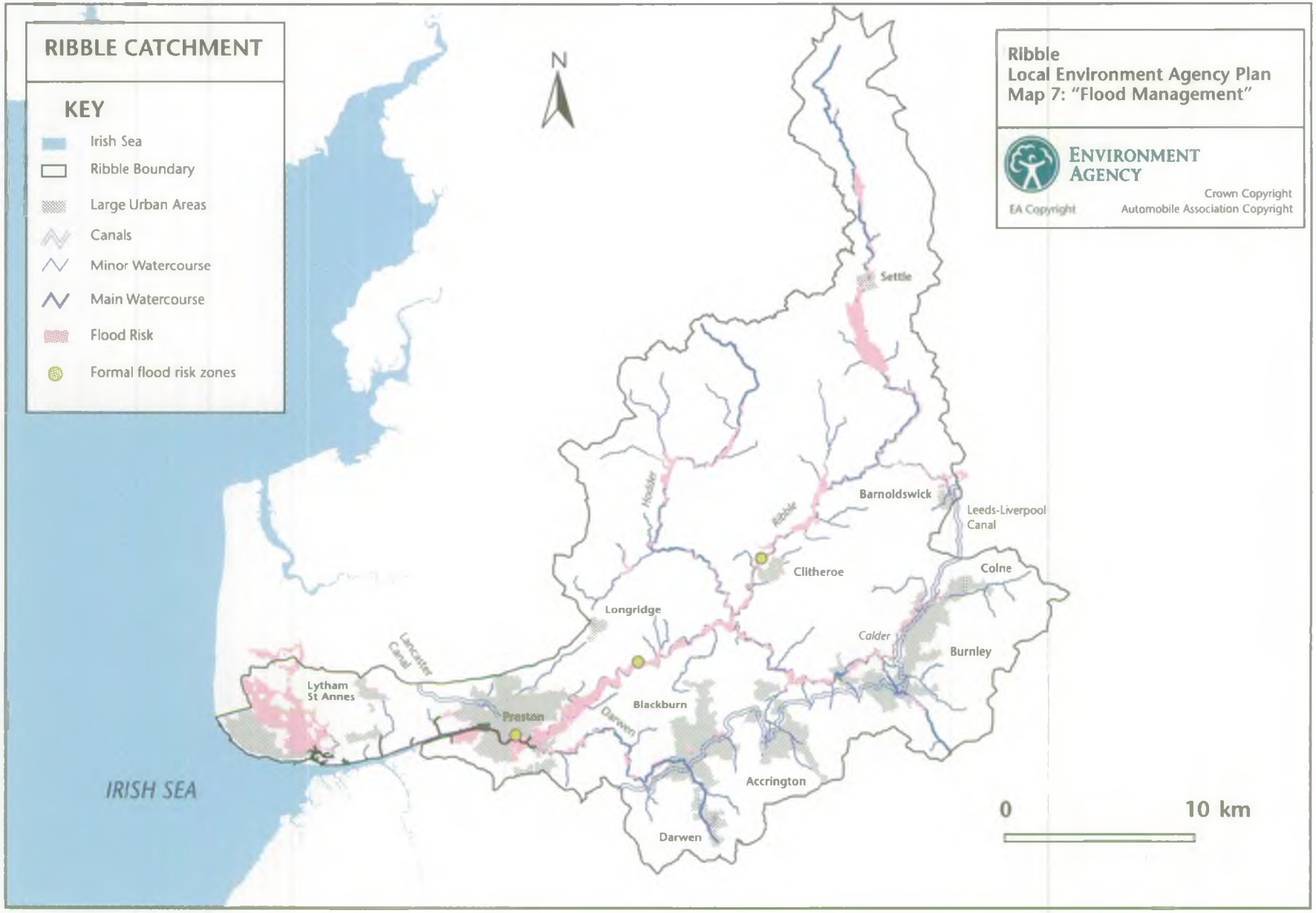
5 Adopt national policy to ensure a common approach to identifying high risk properties (currently 1:50 probability) and review current risk probability.

6 An annual meeting is organised for all Local Authorities and Emergency Services in the Area to attend. In addition to this we have separate meetings with each Local Authority, the Fire Service and Police Force to discuss the dissemination plan and any flooding problems.

Developing flood warning and flood defence emergency response capabilities and links with Local Authorities so that in time of an event each organisation appreciates and understands each other's role as defined by the Environment Agency.

Solutions	Responsibility	Benefit	Timescale
Improve rainfall and river monitoring equipment.	Agency.	Ability to measure extreme flows.	2000.
A standard definition of a major flood.	Agency to prepare.	To give a specific point at which emergency responses are activated.	1999.
Major flooding scenarios to be incorporated in joint exercises.	Agency.	To ensure every organisation knows its role in time of a major flood.	1999.
General awareness advertising in areas of lower flood risk.	Agency.	Ensure consistency throughout the Agency.	1999.
Adopting a National policy on identifying high risk properties.	Agency.	Improved links with. Local Authorities and Emergency Services.	1999.

Solutions	Responsibility	Benefit	Timescale
Annual Liaison meeting with members of Local Authorities and Emergency Services.	Agency, Local Authorities and Emergency Services.	Improved links with Local Authorities and Emergency Services.	1999.
Developing greater links with Local Authorities regarding emergency response capabilities.	Agency/Local Authorities.	An understanding of each organisations roles and what resources are available.	Ongoing.
Mapping of flood area that is deemed to be comparable to an extreme event.	Agency and Local Authorities.	The ability to determine where resources will be required in the event of extreme flooding. Advice to Local Authority Planning Committees.	Ongoing.


RIBBLE CATCHMENT
KEY
Irish Sea
Ribble Boundary
Large Urban Areas
Canals
Minor Watercourse
Main Watercourse
Flood Risk
Formal flood risk zones
N
Ribble
Local Environment Agency Plan
Map 7: "Flood Management"
ENVIRONMENT AGENCY
Crown Copyright
EA Copyright
Automobile Association Copyright
Settle
Barnoldswick
Leeds-Liverpool Canal
Clitheroe
Colne
Longridge
Calder
Burnley
Lancaster Canal
Lytham St Annes
Preston
Blackburn
Darwen
Hodder
Ribble
Accrington
Darwen
IRISH SEA
0
10 km

ISSUE 16: LOCATIONS AT RISK OF FLOODING WITHIN THE RIBBLE AREA.

Background to the Issue: Main rivers are watercourses which have been identified as being essential to the natural drainage of a river area and which have been formally registered with the Ministry of Agriculture, Fisheries and Food. Their status enables us to carry out works of improvement and maintenance. Local Authorities have similar permissive powers to carry out works on non-main rivers.

There are a number of sites throughout the area, which are susceptible to flooding from watercourses.

Locations at risk of flooding within the Ribble area include, see **Map 7**:

1 Low lying property and sports fields at Penwortham.

2 Properties in Ribchester.

3 Agricultural land behind defences at Pool Stream, Freckleton.

4 Agricultural land behind defences at Wrea Brook, Warton.

5 Properties in Barrowford and Lomeshaye.

6 Hospital and residential properties alongside Walverden Water in Nelson.

Flood alleviation works have recently been completed on the Liggard Brook/Main Drain Pumping Station and the Warton Tidal Embankments.

We will continue to exercise development control powers to cover the avoidance of new problems being created through ill advised planning decisions.

Possible Solutions: There will be a campaign in the East Blackburn area to promote Sustainable Urban Drainage Systems (SUDS), particularly aimed at businesses which will help alleviate pressures on storm overflow systems.

Solutions	Responsibility	Benefit	Timescale
Main river problems.			
Require riparian owners to carry out works of maintenance or improvement.	The Agency/ Riparian owners.	Reduced risk of flooding. Minimal cost to public purse.	Dependent on regional priorities and availability of funding.
Agency exercises powers to carry out works of maintenance or improvement.	The Agency.	Reduced risk of flooding.	Dependent on regional priorities and availability of funding.
Flood warning scheme.	The Agency.	Reduced risk of flooding.	On going.
Prevent new flooding problems being created.	The Agency/ Local Authorities.	Proactive approach. No works involved so reduced cost.	
Non main river problems			
Require riparian owners to carry out works of maintenance or improvement.	Local Authorities/ The Agency.	Reduced risk of flooding.	
Ask Local Authorities to exercise their powers to carry out works.	Local Authorities.	Reduced risk of flooding.	On going.
Consider remaining specific sites.	The Agency.	Agency can then choose to carry out works. Reduced flood damage.	
Flood warning scheme.	The Agency.	Proactive approach. No works involved so reduced cost.	
Prevent new flooding problems being created.	The Agency/ Local Authorities.		

Solutions	Responsibility	Benefit	Timescale
Tidal flooding.			
Require riparian owners to carry out works of maintenance or improvement.	The Agency/ Riparian owners.	Reduced risk of flooding. Minimal cost to public purse.	Dependent on regional priorities and availability of funding.
Agency exercises powers to carry out works of maintenance or improvement.	The Agency.	Reduced risk of flooding.	On going.
Flood warning scheme.	The Agency.	Reduced risk of flooding.	On going.
Agency to oppose new development that creates new flooding problems.	The Agency.	Proactive approach. No works involved so reduced cost.	Dependent on regional priorities and availability of funding.

Constraints: 1. Flood Defence works carried out by the Agency must be technically, economically and environmentally acceptable.
2. Availability of funding in Flood Defence budgets.

ISSUE 17: THE STRATEGIC DEVELOPMENT OF RIVER VALLEY INITIATIVES IN THE RIBBLE AREA.

Background to the Issue: We support the development of River Valley Initiatives in the Ribble Area as a way of involving, raising awareness and educating the public in environmental issues.

There are currently five River Valley Initiative (RVI) style activities in the Ribble area. These are:

- Ribble Estuary.
- Ribble RVI.
- Darwen RVI.
- REEL RVI.
- Douglas and Yarrow Valley Action.

All RVIs are organised around a multi-sector Steering Group of public, private and voluntary organisations, with the aim that they support a Project Co-ordinator to engage the public in local environmental issues. They have a good record of working in partnership with a variety of organisations and attract funding from a variety of sources.

The individual RVIs are at different stages of development but it has become clear that there would be some advantages in managing their strategic development.

The key advantages would be a co-ordinated approach to funding bodies and co-ordination of resources and skills between the different RVIs. This would allow comprehensive opportunities for people within the entire Ribble area to become involved in a wide variety of environmental activities. This could include creating habitats, improving access to the countryside and assisting business to improve their environmental performance.

Solutions	Responsibility	Benefit	Timescale
Option 1 – Produce proposals on an integrated approach for the development of RVI's in the Ribble Area.	RVI Partnership involving The Agency.	Integrated approach, sharing of skills and resources.	1999-2000.
Option 2 – Independent development.	RVI Partnership involving The Agency.	Strong local focus for work but lacking a more strategic approach and problems with local funders.	1999-2000.

The Environment Agency Vision for Fisheries is:

"All waters in England and Wales will be capable of sustaining healthy and thriving fish populations and everyone will have an opportunity to experience a diverse range of quality fishing."

The State of Freshwater Fisheries in the Ribble Area

The waters of the River Ribble catchment provide wide ranging facilities for game and coarse anglers as well as supporting commercial salmon, sea trout, and elver fisheries.

River Ribble

Supports major game and coarse fisheries that have suffered a decline in recent years. The river is known to hold salmon, sea trout, brown trout, grayling, chub, barbel, roach, dace, carp, bream, pike, gudgeon, eel, and minor coarse fish species. Many of the important salmonid spawning areas suffer from a general loss of fisheries habitat including severe bank erosion which can lead to siltation of spawning gravels. The river is stocked with brown trout to supplement the natural population for angling purposes. The estuary supports a commercial salmon and sea trout fishery as well as a sea fishery.

River Hodder

Supports an important migratory fishery, a regularly stocked brown trout fishery and, although there is no significant coarse fishery on the river, it is fished for grayling. The 1993 stock assessment of the River Hodder catchment showed that juvenile salmon and sea trout were widely distributed but their populations were limited by the effects of acid stress, low flow problems and total or partial barriers to their upstream migrations. The river suffers low flow problems due to major abstraction from the upper catchment. Fisheries habitat is generally good although erosion is a problem in some areas.

River Calder

Has many barriers, the most important of which is Padiham Weir which effectively prevents the upstream migrations of all species of fish except eels. The only major tributary downstream of this weir is Sabden Brook. In 1996/7 trial stockings of salmon parr were made to Sabden Brook, Colne Water, Wycollar Water, Hyndburn Brook and Admergill Water (tributary of Pendle Water). Follow up surveys have shown good survival rates. The 1993 stock assessment of the Calder catchment showed that brown trout are present mainly in the upper reaches of Pendle Water, Colne Water, the River Brun and in the Calder itself upstream of Burnley. Coarse fish were poorly represented although quantities have since been stocked from Leyland fish farm. The river is also known to also contain roach, dace, chub, barbel, eels, grayling, sea trout and minor coarse fish species.

River Darwen

Has major barriers at Roach Bridge and Samlesbury Bottoms and suffers from water quality problems. The report on the 1996 Stock Assessment of the Darwen Catchment showed that brown trout are present in the river above the town of Darwen and in Davyfield Brook with the rest of the catchment supporting only minor coarse fish species. However, the lower reaches of the river are known to contain coarse fish which have probably migrated from the Ribble and the river has since been stocked at Houghton Bottoms with roach, dace and chub from the Environment Agency Fish Farm at Leyland.

Canals

Leeds and Liverpool and the Lancaster canal provide coarse fishing both in the open countryside and in the heart of the urban environment. The canals are owned and managed by British Waterways (BW) who lease the fishing rights to various angling clubs. The Agency works in partnership with BW and the angling clubs to protect and develop canal fisheries.

They are known to contain roach, rudd, bream, tench, carp species, perch, pike, gudgeon, ruffe and minor coarse fish species. Following a recent pollution incident a major fish kill occurred on the Leeds and Liverpool canal in Blackburn. Despite concerted efforts by BW and the Agency a large number of fish died. Following a successful prosecution taken by the Agency, 1,300 bream and 1,300 roach were re-stocked with a further 1,300 perch to follow.

Reservoirs, lakes and ponds

There are many reservoirs and lakes which provide both coarse and trout fishing. Some of the larger reservoir fisheries include Stocks reservoir (on the Hodder), Cant Clough, Hurstwood, Swinden, Churn Clough, Coldwell, Walverden, Mitchells House, Ogden, Black Moss, Laneshaw (on the Calder), Grimsargh, Spade Mill (Ribble) and Roddlesworth, Earnsdale (on the Darwen). There are also dozens of small ponds and lodges which provide club and day ticket fishing mainly for coarse fish.

Pressures on Freshwater Fisheries in the Ribble area

These include water quality, water quantity, degradation of the riverine habitat, restriction of movement of fish populations and the effects of introduced non-migratory trout. Many of the pressures affecting the salmon and sea trout fisheries are discussed further in the Ribble Salmon Action Plan. The table of pressures on the catchment from the Ribble Salmon Action Plan can be found in **Appendix 2** on page 98.

Achievements since the first Consultation Report, (1995)

The first Consultation Report for the Ribble was the Catchment Management Plan, which was produced by one of our predecessor organisations the National Rivers Authority. Since that report several key actions have been taken to improve the fisheries resource of the Ribble area. These include:

- Completed phase 1 of the River Loud rehabilitation project with the support of the local conservation group Chipping Wildlife and Conservation Society (CWACS). Phase 2 will continue through the Leader 2 project which is a partnership between Ribble Catchment Conservation Trust (RCCT), Lancashire Wildlife Trust (LWT) and Farming and Rural Conservation Agency (FRCA) to facilitate a £90,000 project to restore fisheries habitat in five key Hodder spawning becks through Leader 2 funding. The becks included are Easington, Croasdale, Loud, Birkett and Foulscales.

- The Sustainable Rivers Project and individual Agency projects carried out with angling clubs and landowners are helping to improve fishery habitat by fencing and planting river margins.

- The Bowland Initiative. The Agency is participating in this initiative which is a partnership between farmers, rural development agencies, conservation and environmental organisations, local authorities and MAFF. This is targeted at farms and farming related businesses in the Lancashire Uplands 5(b) Area. This is an experimental scheme which offers a number of benefits which include payments for maintaining and restoring farm landscapes and wildlife habitats.

- Examined optimum stocking practices – See 'Mitton Report'.
- Created fish passes at Stainforth Beck, Newby Weir and West Bradford Brook.
- Cleaned gravel beds at Swanside Beck with the support of angling clubs.
- Eyed ova, fry and salmon parr stocked at Swanside Beck and the Ribble. (The last stocking of fish from Agency Witcher Well hatchery was made in 1997.)
- Stocked roach, chub and dace from Leyland fish farm to the Ribble, Calder, Darwen and the River Loud (Hodder tributary).
- Assisted with the MAFF project to investigate the impact of bird predation on fish stocks in the Ribble area.
- Fishery seminars have been held to promote good fishery management, habitat enhancement and understanding of fishery issues.
- Cleared around 20 tree blockages within watercourses which were hindering the free passage of fish and causing localised bank erosion.
- Enforcement achievements.
- Targeted rod licence enforcement to minimise evasion by utilising information from the National Rod Licence Centre.
- Two notable successes in the last three years in prosecuting salmon poachers. This resulted in prison terms of three and 15 months for the offenders.
- Cross border liaison with Environment Agency Wales and Police forces regarding coarse fish theft and covert surveillance techniques.

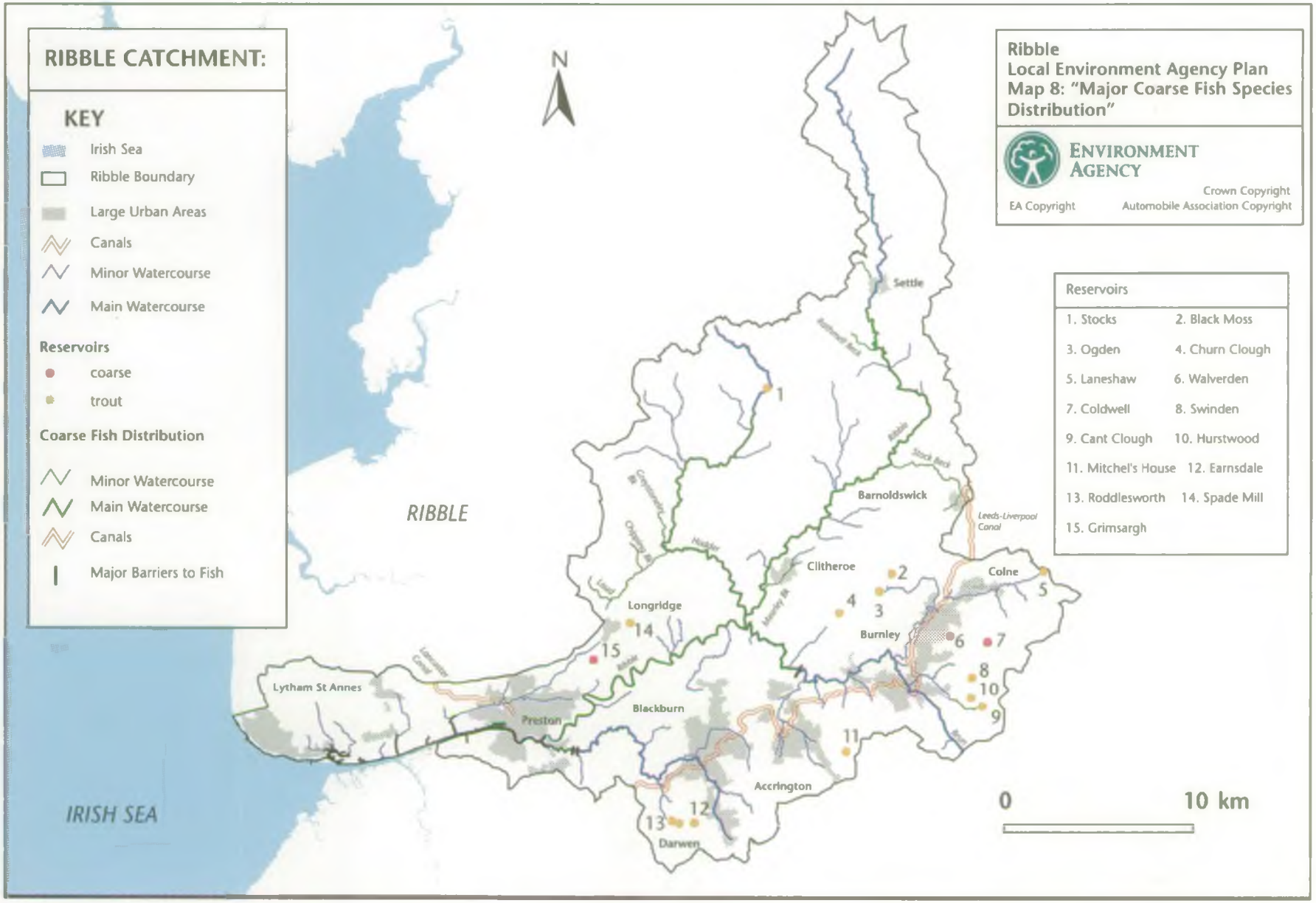
Whilst improvements have been achieved there are still issues to be resolved to allow for the continual improvement of the fisheries resource in the Ribble area.

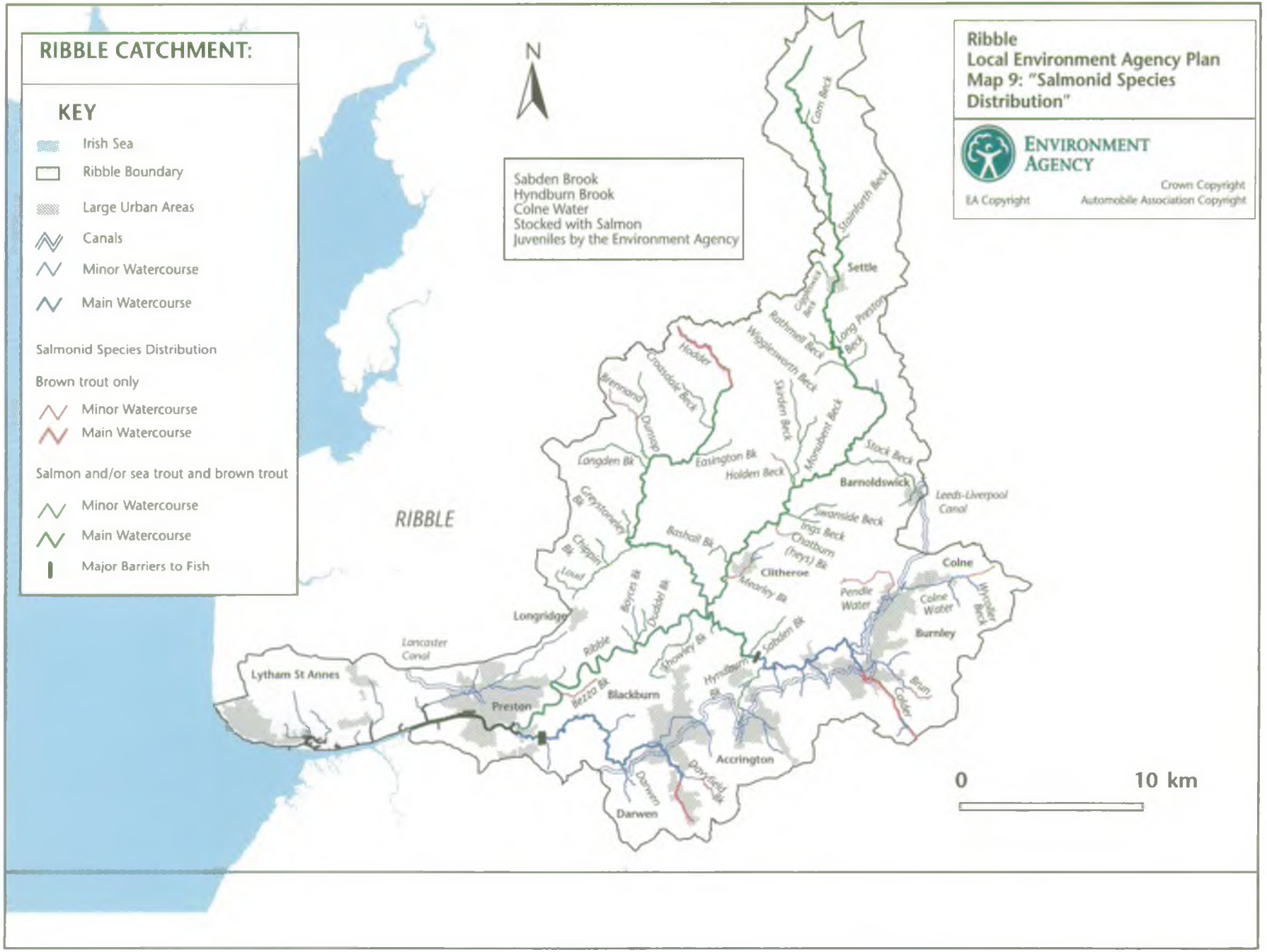
The issues to be included in this section are:

Issue 18 The Adverse impact of direct and indirect stocking of trout.

Issue 19 Degradation of in river fisheries habitat.

Issue 20 Adverse impact of man made barriers to the migration of fish.


RIBBLE CATCHMENT:
KEY
Irish Sea
Ribble Boundary
Large Urban Areas
Canals
Minor Watercourse
Main Watercourse
Reservoirs
coarse
trout
Coarse Fish Distribution
Minor Watercourse
Main Watercourse
Canals
Major Barriers to Fish
N
Ribble
Local Environment Agency Plan
Map 8: "Major Coarse Fish Species Distribution"
ENVIRONMENT AGENCY
Crown Copyright
EA Copyright
Automobile Association Copyright
Reservoirs
1. Stocks
2. Black Moss
3. Ogden
4. Churn Clough
5. Laneshaw
6. Walverden
7. Coldwell
8. Swinden
9. Cant Clough
10. Hurstwood
11. Mitchel's House
12. Earnsdale
13. Roddlesworth
14. Spade Mill
15. Grimsargh
RIBBLE
IRISH SEA
Settle
Barnoldswick
Clitheroe
Colne
Longridge
Burnley
Lytham St Annes
Preston
Blackburn
Accrington
Darwen
Leeds-Liverpool Canal
0
10 km


RIBBLE CATCHMENT:
KEY
Irish Sea
Ribble Boundary
Large Urban Areas
Canals
Minor Watercourse
Main Watercourse
Salmonid Species Distribution
Brown trout only
Minor Watercourse
Main Watercourse
Salmon and/or sea trout and brown trout
Minor Watercourse
Main Watercourse
Major Barriers to Fish
N
Sabden Brook
Hyndburn Brook
Colne Water
Stocked with Salmon
Juveniles by the Environment Agency
Ribble
Local Environment Agency Plan
Map 9: "Salmonid Species Distribution"
ENVIRONMENT AGENCY
Crown Copyright
EA Copyright
Automobile Association Copyright
RIBBLE
Settle
Barnoldswick
Clitheroe
Colne
Burnley
Longridge
Lytham St Annes
Preston
Blackburn
Accrington
Darwen
Lancaster Canal
Leeds-Liverpool Canal
0
10 km

ISSUE 18: THE ADVERSE IMPACT OF DIRECT AND INDIRECT STOCKING OF TROUT.

The Issue: We aim to ensure the development of sustainable populations of fish. One of the issues affecting this aim is the stocking of brown trout.

Background to this Issue: A large quantity of brown trout are stocked intentionally to the river by angling clubs and riparian owners. An unknown quantity of brown trout and rainbow trout escape from reservoirs and fish farms and are therefore stocked indirectly to the river. These fish are of a size that will predate on juvenile populations which have bred naturally within the river, ie. salmon, sea trout, brown trout and coarse fish species. They will also compete with fish of a similar size for the available territory and food resource.

Possible Solutions: To work with interested parties in developing a sustainable stocking strategy for the River Ribble. Improved screening to reduce escapees entering the River. Enhancement of in river habitat should improve natural productivity and reduce the requirement for direct stocking.

Solutions	Responsibility	Benefit	Timescale
Gain agreement with interested parties to develop a sustainable brown trout stocking strategy.	The Agency/ riparian owners/ Angling Clubs/ RFERAC's/Ribble Fisheries Association/ Fish farmers.	A co-ordinated policy should substantially reduce adverse impacts of brown trout stocking.	2002.
Improve natural fish populations by habitat restoration. See also Issue 25.	The Agency/riparian owners/Angling Clubs/ RFERAC's/Ribble Fisheries Association See Issue 25.	The development of more sustainable fish populations.	2000-2005.
Reduce number indirectly stocked by improving reservoir and fishery screens.	The Agency. *(By implementing section 14 Salmon and Freshwater Fisheries Act 1975)*/Fishery owners/ Fish farm owners.	Reduced number of brown and rainbow trout escapees.	2000-2005.

Constraints: Lack of agreement between interested parties.

ISSUE 19: DEGRADATION OF CUT RIVERINE FISHERIES HABITAT.

The Issue: There has been an ongoing loss of holding pools, spawning areas and juvenile habitat for fish. This has the effect of reducing the potential productivity of the fisheries of the River Ribble.

Background to this Issue: The lack of bank side vegetation and increased peak river flow rates has lead to increased erosion of the banks. This causes over-widening and loss of habitat diversity with eroded silt being deposited on spawning gravel making them unsuitable for use. Reservoirs and water intakes can act as gravel traps thus denuding the river of spawning substrate. The Sustainable Rivers Project, Leader 2 project, the Bowland Initiative and individual Agency projects are already addressing these problems. Many problems associated with the lack of bankside habitat will be addressed in Issue 25. This issue concentrates on in river habitat improvements.

Possible Solutions: Use in river structures such as willow raddling to help restore natural features. Clean and de-silt spawning gravel to make them viable. Re-introduction of gravel downstream of gravel traps should help increase spawning substrate availability.

Solutions	Responsibility	Benefit	Timescale
Use environmentally sensitive techniques such as willow raddling to help recreate valuable habitat features.	The Agency/riparian owners/Angling Clubs/ Ribble Fisheries Association.	Increased habitat diversity.	2000-2005.
De-silt existing spawning gravel.	The Agency/riparian owners/Angling Clubs/ Ribble Fisheries Association.	Provision of clean gravel for the spawning season.	2000-2005.
Re-introduce gravel downstream of reservoirs and other gravel traps.	The Agency/North West Water Ltd/BW/ Angling Clubs/ Reservoir Owners	Reformation of lost spawning areas.	2000-2005.
The Sustainable Rivers Project.	The Agency.	Promoting good management practices to improve fisheries habitat.	
The Leader 2 project.	The Project Partners.	Habitat improvement.	2000-2005.
The Bowland Initiative.	The Project Partners.	Habitat improvement.	2000-2005.
Individual Agency projects.	The Agency/Angling Clubs/Farmers/ Landowners.	Habitat improvement.	2000-2005.

Constraints: Lack of funding. Lack of volunteers to assist with the works.
Lack of co-operation from involved parties.

ISSUE 20: ADVERSE IMPACT OF MAN MADE BARRIERS TO THE MIGRATION OF FISH.

The Issue: We aim to ensure that fish are allowed to swim freely along the rivers of the Ribble area to enable their populations to become sustainable and healthy. An issue of concern is that along the Rivers Ribble, Calder, Hodder and Darwen a number of man-made barriers have a direct influence on the successful movements of all species of fish.

Background to this Issue: The barriers reduce access to available spawning grounds, prevent the mixing of populations of the same species and isolate some species from entire sections of the river, see **Map 8** for the distribution of species. Many of these obstructions are a legacy of the industrial history of the region. The restriction of free movement of all species of fish is particularly important following pollution upstream of these obstructions that then prevent natural re-population. Also, as minor coarse fish species are not re-stocked, species such as bullhead, stickleback, stoneloach and minnow are then excluded from the area. The Agency would like to see all barriers made passable except for those that isolate an important population such as one of natural brown trout. The heritage value of the barrier will be assessed and the possibility of passage for small craft will be considered where required.

Padiham weir on the River Calder is an example of a major barrier. There have been significant improvements in the water quality of the river Calder and many areas support populations of non migratory fish. However, the size and height of the weir at Padiham prevents the upstream passage of all species of fish, except eels. Brown trout and sea trout have been seen attempting and failing to leap the weir structure. Salmon and sea trout are therefore largely excluded from the Calder by this weir. Work in collating baseline data for this weir has been completed and a feasibility study to investigate the options for fish passage is underway.

Possible Solution: Identify and assess the impact of all the barriers on the Ribble area and draft a list of priorities. Schemes to provide fish passes or the possible removal of weirs could be addressed depending upon funding and collaborations with other organisations. Landscape and conservation issues will be taken into account at each site.

Solutions	Responsibility	Benefit	Timescale
Identify and assess the impact of all the barriers on the Ribble.	The Agency, Riparian landowners, Angling clubs.	Produce a list of priorities.	2000-2001.
Provide fish passes or completely remove the obstructions as funding permits.	The Agency, Riparian landowners, Angling clubs.	Improve access to spawning grounds and allow free movement of fish populations.	2000-2005 And future.

Solutions	Responsibility	Benefit	Timescale
Continue to progress the scheme on Padiham weir.	The Agency, River Enhancement East Lancashire (REEL), Riparian landowners.	Encourage runs of migratory fish back to the Calder system.	Until completion.
Investigate possible areas of funding and collaboration.	The Agency, River Enhancement East Lancashire (REEL) Other funding bodies.	Provide resources to progress the works.	2000-2005.

Constraints: Lack of funding.

State of the Landscape and Heritage in the Ribble Area

The Ribble area is highly variable in geography, geology and human influence. Much of the area is rural with areas of land designated to safeguard this nature including a part of the Yorkshire Dales National Park and the Forest of Bowland AONB (Area of Outstanding Natural Beauty). The eastern side is much more urbanised with the settlements of Burnley, Accrington, Blackburn leading to Preston, see **Map 10.**

This landscape provides a variety of opportunities for recreational activities including walking, cycling, angling, shooting, canoeing and boating.

The Forest of Bowland in particular has many recreational pursuits with 1,319Ha of open country with a freedom to roam under access agreements with Lancashire County Council and landowners. There are also five YHA camping barns and eight picnic sites to encourage visitors, whose activities need to be managed in order to safeguard the natural interest of the Forest which has areas that are important breeding grounds for upland birds.

The Lancashire Cycleway also takes in the Forest of Bowland. The two circular routes, each around 130 miles long, also take in local cycle paths.

For walkers the Ribble Way is approximately 70 miles of footpath that follows the course of the Ribble from its source in the Yorkshire dales down to the Estuary.

There are two canals in the area, the Lancaster and the Leeds-Liverpool canals that are suitable for boating. Although there is neither right of navigation above either the tidal limit or any known access agreement in place, parts of the Ribble are used by canoeists.

Pressures on the Landscape of the Ribble Area

The general pressures on land include the development of urban areas, transport networks, changing agricultural markets and the intensification of agriculture and the use of land by extractive industries and for waste disposal. Particularly in the past the landscape has also been changed as watercourses have been altered to improve land drainage. The creation of flood defences also affects the landscape character.

The countryside is also under pressure from visitors whose recreational activities may have a detrimental effect on the landscape qualities that bring them to the area.

Achievements since the first Consultation Report, (1995)

The first Consultation Report for the Ribble was the Catchment Management Plan, which was produced by one of our predecessor organisations the National Rivers Authority. Since that report several key actions have been carried out to help to sustain the landscape of the Ribble area. These include:

- The completion of an archaeological survey of the area.

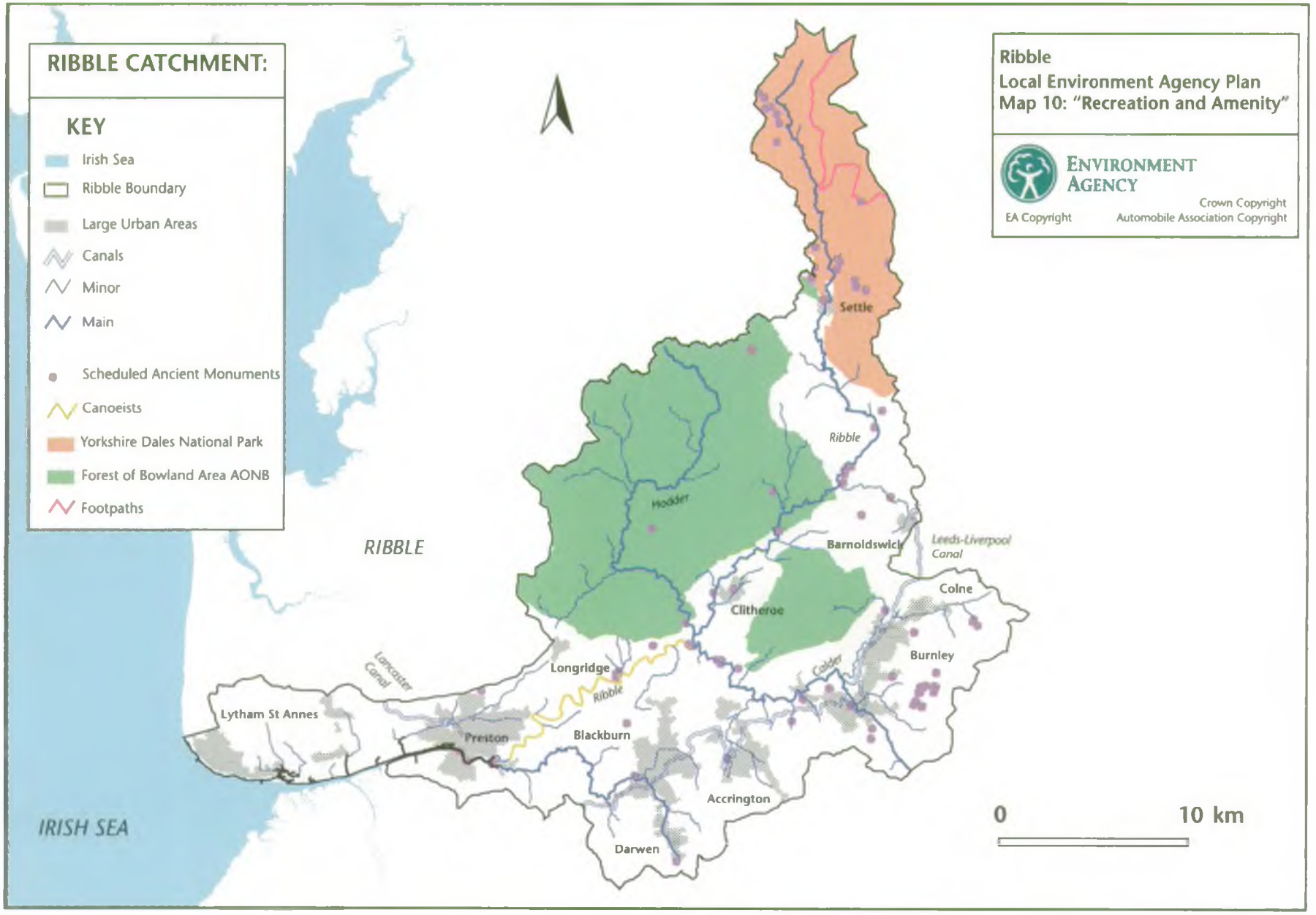
- Improved access to the river at Whalley Old Road, King Street, George Street and Lutner Street.
- Developed a sustainable Rivers Project that is promoted by FWAG (Farming and Wildlife Advisory Group).
- Supported Local Authorities to make safe contaminated land at the former Fina site in Preston and The Darwen Gas Works site in Darwen.
- Installed angling platforms on the Ribble in partnership with Ribble Valley Borough Council.
- Building relationships with other users through Lancashire County Councils Rights of Way meetings, Bowland AONB Joint Advisory Committee meetings.

Whilst improvements have been achieved there are still issues to be resolved to allow for the sustained improvement and protection of the landscape in the Ribble area.

Issues Relating to the Landscape of the Ribble Area

Issue 21 Lack of awareness of and poor access to watercourses.

Issue 22 The opportunities for development of brownfield and contaminated land sites.


RIBBLE CATCHMENT:
KEY
Irish Sea
Ribble Boundary
Large Urban Areas
Canals
Minor
Main
Scheduled Ancient Monuments
Canoeists
Yorkshire Dales National Park
Forest of Bowland Area AONB
Footpaths
Ribble
Local Environment Agency Plan
Map 10: "Recreation and Amenity"
ENVIRONMENT AGENCY
Crown Copyright
EA Copyright
Automobile Association Copyright
RIBBLE
IRISH SEA
Settle
Ribble
Hodder
Barnoldswick
Leeds-Liverpool Canal
Colne
Clitheroe
Burnley
Longridge
Lancaster Canal
Ribble
Calder
Lytham St Annes
Preston
Blackburn
Accrington
Darwen
0
10 km

ISSUE 21: LACK OF AWARENESS OF AND POOR ACCESS TO WATERCOURSES.

Background to the Issue: In the Ribble area, especially in the more urban areas of the Calder area, rivers and other water bodies represent one of the few natural features, and are an excellent resource for information and education. At present this resource is under utilised and we aim to encourage more people to visit the area. In many areas, especially urban areas, access to the watercourses is limited, which restricts both formal and informal recreation such as walking, cycling, canoeing, horse riding and angling. Moreover, reduced awareness and public perception of the riparian environment can result in a tendency to misuse and disregard this asset.

We are keen to promote awareness and use of watercourses as recreational, educational and ecological assets. Improved access to watercourses, where appropriate, will help to encourage the public perception of watercourses and may help to discourage misuse. This must be targeted to suitable areas and should have local community ownership to ensure maximum benefit. Where increased use occurs it is possible that conflicts of interest between the various user groups may arise. If they do arise our role will be to broker formal agreements.

Possible Solutions: A survey to locate specific areas that require improved access, or where access exists but is currently under utilised is required. Work in collaboration with local councils, community groups, the River Enhancement East Lancashire (REEL) and Darwen and Ribble RVI's will help to solve this issue. Identifying areas of conflict as they arise and helping to achieve agreements which resolve the problem.

Solutions	Responsibility	Benefit	Timescale
Locate specific areas that require improved access or where access exists but is currently under utilised.	Land owners, Local Authorities and The Agency.	Allows targeting of resources to areas that will generate the most benefit.	1999-2004.
Work in collaboration with local councils and community groups to develop action plans.	Land owners, Local Authorities and The Agency.	Help identify areas where people want greater accessibility and link with other partners to make the best use of resources that are available.	1999-2004.

Solutions	Responsibility	Benefit	Timescale
Promote new attractions.	The Owners, Local Authorities.	Raise awareness of available facilities.	1999-2004.
Education of various groups to raise awareness of their impact upon the environment and others.	Land owners, Local Authorities and The Agency.	Reduces the likelihood of problems occurring.	1999-2004.
Broker formal agreements where conflicts arise.	Land owners, Local Authorities and The Agency.	Reduces the likelihood of problems occurring.	1999-2004.

Constraints: Improving access to the watercourse may have a negative effect on the existing wildlife of the area, any access improvements must bear this in mind. Risk of greater access for fly-tipping.

ISSUE 22: THE OPPORTUNITIES FOR DEVELOPMENT OF BROWNFIELD LAND SITES.

Background to the Issue: In the Ribble area there are a number of brownfield sites which have the potential to be brought back into beneficial use through redevelopment and landscaping. This would turn the currently unproductive land into a valuable place for wildlife and people. The sites under consideration are:

- **Riversway, Preston**

Contaminated soils and groundwater have been identified at Riversway in Preston. This pollution has been associated with the historical use of the site as a former oil terminal. With storage and distribution of petroleum products being undertaken by pipelines, sea, road and rail.

- **Closed landfill sites**

Fourteen closed landfill sites in Lancashire were identified as potentially suitable for increasing public access and improving bio-diversity. They were assessed in relation to their current usage, size, state, access and ecological status. The assessment resulted in the choice of six sites for enhancement to provide public recreation and to improve wildlife habitat.

The sites are: Huncoat, Bull Hill in Darwen, Lower Barnes Street in Clayton-le-Moors, Farholmes in Church, Knotts Lane in Colne and Chatburn.

Solutions	Responsibility	Benefit	Timescale
Riversway, Preston. Identify degree of contamination and remediate.	Lead responsibility is Preston Borough Council in partnership with the Agency.	Remedial works will prevent pollution of the Fylde Aquifer and minimise risk of pollution to adjacent River Ribble.	Phase I Remediation commenced April 1999.
Closed landfill sites. Identify sites and improve public access and enhance Bio-diversity.	Lancashire County Council.	By improving access recreational benefits would be improved and there would be a general increase in environmental awareness amongst local people. Tree planting and maintenance projects would enhance the wildlife habitat and therefore improve the natural bio-diversity of these areas.	1998-2001.

State of the Bio-diversity in the Ribble Area

In simple terms biodiversity is the variety of life which includes the amazing richness of species that share our environment. This immense diversity has evolved over countless millennia into the irreplaceable natural asset that it represents today. Issues concerning biodiversity are closely linked to those of the landscape. Human impacts on biodiversity in turn affect habitat quality, which in turn affects the value of the landscape.

Although the concept of enhancing biodiversity applies to the whole of the Ribble area, there are certain sites that are recognised as particularly 'special' for their biodiversity and these sites receive certain levels of conservation protection. In UK law the highest level of conservation protection is afforded to sites that are internationally important for their wildlife. These include Special Areas of Conservation (SACs) designated under the EC Habitats Directive, Special Protection Areas (SPAs) designated under the EC Birds Directive (1979), and wetlands of international importance known as Ramsar sites, see **Map 11**.

The Ribble LEAP includes two key areas of international significance for biodiversity. These are the Bowland Fells SPA and the Ribble Estuary (which constitutes the majority of the area of the Ribble and Alt Estuaries) SPA and Ramsar site. The Bowland Fells area is the largest continuous area of heather moorland in Lancashire and is an important breeding area for upland birds such as red grouse, ring ouzel, golden plover, curlew, short-eared owl and hen harrier. The Ribble Estuary SPA and Ramsar site also contains two National Nature Reserves. It is a large estuary supporting great numbers of migrating and wintering waders and wildfowl; there are vast flocks of knot, dunlin, oystercatcher, pink-footed geese and widgeon.

There are many sites of national conservation significance in the Ribble LEAP. Such sites are protected as Sites of Special Scientific Interest (SSSIs). These include a range of species and habitats such as unimproved grasslands (eg. Myttons Meadows) and woodlands (eg. Rough Hey Wood). Part of the Upper River Ribble (Long Preston Deeps), is itself a SSSI on account of its rich plantlife.

At a more local level there are sites that although not recognised nationally or internationally are recognised as being rich in local biodiversity. In Lancashire these are known as County Biological Heritage Sites and these sites receive some protection through Local Planning Authorities and the actions of bodies like the Environment Agency.

The Ribble Area includes four Natural Areas: Lancashire Plain and Valleys, Southern Pennines, Yorkshire Dales and the Forest of Bowland. Natural Areas were created by English Nature to link the wider countryside to an existing system of designations. Put simply they are areas with recognisably similar biodiversity and natural features. Conservation profiles, which include long term conservation objectives, have been drawn up for the Natural Areas.

The UK Biodiversity Action Plan (BAP) has highlighted the priority species and habitats at a UK level. Under the plan, we are the national 'Contact Point' for otter, water vole and white-clawed crayfish, all of which require priority conservation action and occur within the LEAP area. Local Biodiversity Action Plans (BAPs) are now starting to be drawn up for Lancashire and North Yorkshire within the Ribble LEAP area. These plans will be prescriptive and precise, with realistic and achievable targets for biodiversity conservation.

Pressures on Biodiversity in the Ribble Area

Along with the general pressures on the landscape which will impact upon the biodiversity of the area eg. change in land use, plants and animals in the Ribble area are also under pressure from reduced flows in rivers and reduced water levels in some wetlands. There is also concern over competition from non-native and invasive species.

Achievements since the first Consultation Report, (1995)

The first Consultation Report for the Ribble was the Catchment Management Plan, which was, produced by one of our predecessor organisations the National Rivers Authority. Since that report several key actions have been taken to safeguard the bio diversity of the Ribble area. These include:

- Completed a survey of otter populations in the Ribble area.
- Produced a report and seminar on the impact of non-native crayfish in the Ribble area.
- Developed a programme for the control of Giant Hogweed.
- Developed the 'Sustainable Rivers Initiative' as a demonstration project.

We are committed to working in partnership and as such are involved with:

- Support for Local Biodiversity Action Plans (Yorkshire Dales National Park and Lancashire) both in preparation and implementation.
- A Lancashire Biodiversity Forum (with Agency support and participation).
- Completion of the biodiversity audit of NW England.
- Support English Nature's Restoration of Native Broad – leafed Woodland proposals in Bowland both in preparation and implementation.

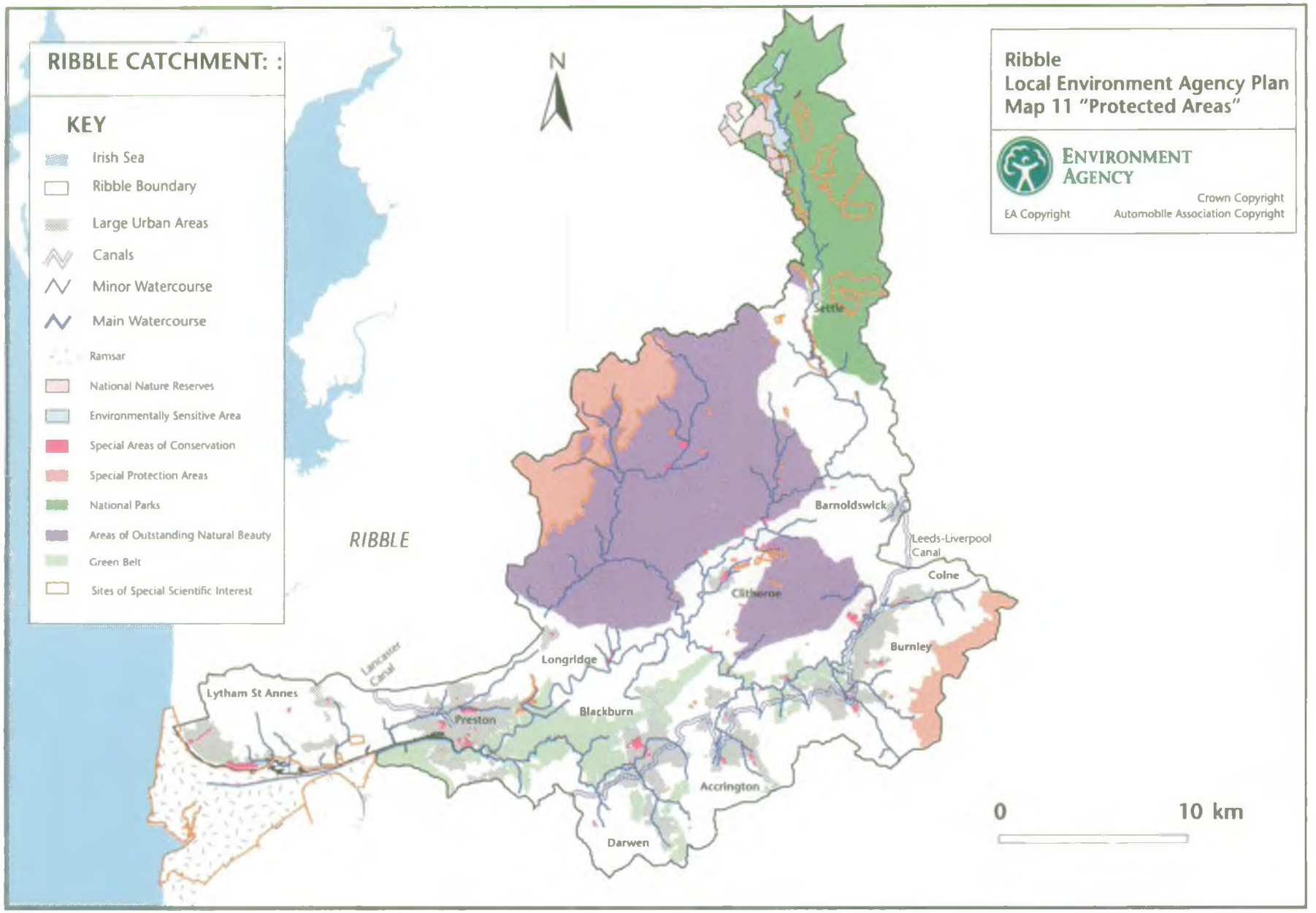
Whilst improvements have been achieved there are still issues to be resolved to safeguard the biodiversity of the Ribble area.

Issues Relating to Biodiversity in the Ribble Area

Issue 23: High levels of erosion in the Ribble area.

Issue 24: The need for conservation and enhancement of Otter, Water Vole and White Clawed Crayfish population together with other species shortlisted in the UK Biodiversity Action Plan.

Issue 25: The need for River Rehabilitation and Management.


RIBBLE CATCHMENT: :
KEY
Irish Sea
Ribble Boundary
Large Urban Areas
Canals
Minor Watercourse
Main Watercourse
Ramsar
National Nature Reserves
Environmentally Sensitive Area
Special Areas of Conservation
Special Protection Areas
National Parks
Areas of Outstanding Natural Beauty
Green Belt
Sites of Special Scientific Interest
N
RIBBLE
Ribble
Local Environment Agency Plan
Map 11 "Protected Areas"
ENVIRONMENT AGENCY
Crown Copyright
EA Copyright
Automobile Association Copyright
Settle
Barnoldswick
Leeds-Liverpool Canal
Colne
Clitheroe
Burnley
Longridge
Lancaster Canal
Lytham St Annes
Preston
Blackburn
Accrington
Darwen
0
10 km

ISSUE 23: HIGH LEVELS OF EROSION IN THE RIBBLE AREA.

Background to the Issue of high levels of erosion in the Ribble area

A habitat survey of the Ribble area has highlighted how much the landscape has changed over the last fifty years, mainly due to changing agricultural practices. The amount and diversity of riverbank wildlife has suffered as a consequence. The loss of riverbank plantlife means that riverbanks are not as well protected which has resulted in accelerated rates of erosion. A further result of these changes has been the spread of non-native invasive species such as Giant Hogweed, Himalayan Balsam and Japanese Knotweed. These not only take the place of native plants but they do not hold the riverbank together as well, leading to problems of erosion.

Erosion has a number of results. Land is washed away by the powerful force of the rivers. The silt, which is added into the river, can cause problems with the silting up of spawning gravels and the deposition of silt in places where it can accentuate problems and cause flooding.

Features, which result from erosion such as earth cliffs, are also extremely valuable to wildlife, for nest holes for sand martin and kingfishers and burrows for water voles for example. Erosion is a natural consequence of an active watercourse and the aim is not to prevent all erosion but to highlight areas where it is a recent and severe problem and try to combat this.

Possible Solutions: We have developed The Sustainable Rivers Management Project to test possible solutions and act as a demonstration project. This has now been in progress for over one year and has concentrated on trialing methods to prevent bankside erosion.

Methods of sustainable bank protection have included fencing, riverbank tree planting and willow raddling. Willow raddling involves weaving bundles of live willow cuttings around stakes that are driven into the bankside. These have been established on stretches of Easington Brook, Bashall Brook and the River Ribble at Sawley.

The Easington stretch also contains scientific monitoring equipment to allow the scheme to be accurately evaluated.

Farm walks at the three demonstration stretches, together with an evening talk at Waddington, have been conducted to launch the project.

Further projects include the Hodder Project, which has the aim to fence and plant with trees 1.6km of the River Hodder.

Control of invasive weeds along watercourses is also a priority. Giant Hogweed has been targeted for a number of years. A measure of the success of this targeted approach is that the amount needing to be spent on control has reduced from just over £17,000 in 1995 to approximately £7,500 in 1998. Areas identified still in need of control are:

Arley and Alum House Brooks – 3,700m

River Darwen – 12,900m

Many Brook – 800m

Duddle Brook – 2,800m

River Calder – 14,700m

River Ribble – 33,400m

Fish House Brook 200m

Tram Brook – 400m

Savick Brook

Control of the spread of Japanese Knotweed has proved more difficult. It is very resistant to herbicides, which are safe to use near watercourses, and propagates prodigiously. It is also extremely destructive. The roots of the plant are capable of penetrating walls and weakening flood defences. The control of Japanese Knotweed will be targeted at a number of small catchments until an effective method of control has been discovered. Areas highlighted for control include:

River Blakewater – 2,100m

River Darwen – 2,000m

River Calder – 1,700m

River Hyndburn – 500m

Solutions	Responsibility	Benefit	Timescale
Sustainable Rivers Project to promote the installation of fencing to prevent livestock overgrazing and poaching of river banks.	The Agency, landowners, FWAG, farmers, Angling clubs, Forestry Authority.	Less erosion. Improve visual, wildlife and fisheries value Reduction in silt in rivers. Create buffer zones. Improve water quality by limiting diffuse run off.	1997-2002.
Control of Giant Hogweed and Japanese Knotweed.	The Agency, LA, landowners.	Increased bank stability, Riverside wildlife improvement.	Ongoing.

ISSUE 24: THE NEED FOR CONSERVATION AND ENHANCEMENT OF OTTER, WATER VOLE AND WHITE CLAWED CRAYFISH POPULATION TOGETHER WITH OTHER SPECIES SHORTLISTED IN THE UK BIODIVERSITY ACTION PLAN.

Background to the Issue: The need for conservation and enhancement of Otter, Water Vole and White Clawed Crayfish population together with other species shortlisted in the UK Biodiversity Action Plan.

The Water Vole and the Freshwater White Clawed (Native) Crayfish are protected by law and also short-listed in the UK Bio-Diversity Action Plan.

An otter survey of the Ribble area in 1998 confirmed that the current population is small and fragile.

Voles have declined dramatically in recent years for a number of reasons. The main factors seem to be predation by mink and habitat degradation.

Crayfish are very sensitive to both organic and toxic pollutants, for example sheep dips. A further threat is crayfish plague, which is carried by the American signal crayfish.

Possible Solutions: A River Habitat Survey of the River Ribble is planned for 1999/2000, depending on available funding. This will give more and better information and identify areas that may need enhancement.

The proposed tree planting and increased bankside vegetation, see above; will benefit otter populations in the future. If the survey shows there to be lack of potential sites for otters to make their homes in, then artificial holts (otter homes) may be constructed.

Previous records of Water Voles are currently being sought and compiled by Environment Agency Ecologists on a database to indicate their historical spread and identify areas which may still be a stronghold. This is to be mapped onto a GIS system enabling easy translation of the information. This is to be regularly updated with incoming information.

A comprehensive presence/absence water vole and mink survey of the catchments in Central area is planned over the next five years. The Ribble Catchment is identified for a comprehensive survey in 2004. Prior to this, areas under particular threat from development or management will be strategically surveyed and monitored.

A White Clawed Crayfish survey is identified for action in 1999/2000. The crayfish population in the upper reaches of the main River Ribble was severely affected by pollution by Synthetic Pyrethroid Sheep-dip in 1997 (see Issue 8). The survey will assess the recovery of crayfish populations to those areas affected by the incident. The survey will also include an overall assessment of crayfish populations. Following these, specific problems which may be affecting the crayfish population, whether through water quality or habitat loss can be identified and addressed.

The River Habitat Survey outlined previously will provide information about the availability of suitable habitats within the area, for both species.

Solutions	Responsibility	Benefit	Timescale
Complete detailed River Habitat Survey for the Ribble.	The Agency.	Identify suitable habitat for Otter, water vole and crayfish.	2000.
Promote Sustainable Rivers Project and similar projects.	The Agency, FWAG, Landowners.	Improved bankside habitat.	1999-2004.
Use baseline Otter survey to identify and refine areas that require habitat improvement.	The Agency, Landowners.	Prioritisation of habitat enhancement, able to target resources more effectively.	1999-2004.
Undertake baseline survey for watervole.	The Agency, Lancashire Wildlife Trust, English Nature, North West Water.	Identification of populations under threat enabling mitigation, also identification of spread of water voles and strongholds.	(1999-) 2004.
Undertake White Clawed Crayfish survey.	The Agency LWT, English Nature.	Assessment of recovery of crayfish populations, identification of problems which are having a significant affect.	1999/2000.

ISSUE 25: THE NEED FOR RIVER REHABILITATION AND MANAGEMENT.

Background to the Issue of the need for River Rehabilitation and Management

The urban parts of the area have a legacy of man-made landscape that offers considerable scope for regeneration and enhancement for people and wildlife. Rivers flowing through urban areas offer a unique opportunity to bring nature into towns and considerable 'quality of life' enhancement can be achieved by river habitat improvement.

We have carried out a river landscape assessment for the Ribble area. This has identified the relative character and condition of the landscape and identified a management strategy for each section of river. The strategy was one of conservation for a landscape on good condition with a strong character. Where the landscape is partly degraded then a restoration strategy is proposed. Where landscapes are badly degraded and lacking in character then an enhancement strategy is proposed. The Management Strategy looked at both the river itself and its channel as well as the surrounding landscape.

For the vast majority of the rivers in the Ribble area landscapes were found to be in good condition with a strong landscape character. Therefore for most of the rivers a strategy of conservation is proposed.

Where the Calder passes through Burnley town centre and around Padiham the river is in need of restoration and in places enhancement of its own channel and its valley landscape. Similarly, where Pendle Water flows from Nelson to the River Calder, the river channel and its surrounding landscape are in need of restoration. The River Darwen where it flows from Darwen through Blackburn and further downstream, from Higher Walton to the River Ribble is also in need of restoration. The Ribble itself is generally in good condition through most of its length until it flows around Preston where its channel and surrounding landscape are in need of restoration.

This issue is linked to the need to improve riverine habitats for fisheries, see Issue 18.

Possible Solutions: As the majority of the sites identified in need of restoration are urban we would want to encourage local communities, local authorities and developers to take part in their enhancement.

Solutions	Responsibility	Benefit	Timescale
Work with local authorities and local communities to address degraded river stretches.	The Agency, Local authorities, Local communities, Groundwork Trusts.	Identification of particular problem stretches of watercourse and development of strategy to combat problem.	1999-2004.
Publicity of our assessment within local authorities and Encourage local authorities to draw up development briefs that respect the river.	The Agency.		

State of waste management in the Ribble Area

In Lancashire, Lancashire County Council is responsible for the disposal of municipal waste and for the Planning Control of all forms of waste disposal. As a unitary authority Blackburn with Darwen Borough Council fulfil this function in their Borough. Management of waste issues need to be considered within this context. The figures below are based on information collected on a County basis but include and reflect what happens in the Ribble LEAP Area.

Approximately four million tonnes of waste is produced in Lancashire each year and 95% of it is disposed of within the County.

The vast majority of waste that is collected is disposed of by being buried at landfill sites. Although most sites are engineered to the highest specification there is still a risk from pollution.

There are other options for the management of waste. These include burning waste as a fuel to generate heat and power, sorting the waste to allow for greater reuse and recycling, composting and trying to minimise the amount of waste generated. This is sometimes referred to as the waste hierarchy as depicted above.

The favoured option for dealing with waste is to seek to minimise the amount produced and to encourage greater levels of reuse and recycling. The Government is seeking to encourage a movement towards this with a number of measures including the introduction of legislation and targets.

The introduction of the Landfill Tax will make disposal of waste at landfill site more expensive and hence a less attractive option. This should create a greater impetus to find alternatives to landfill and it will also influence the cost effectiveness of those alternative options.

The Government has also introduced Packaging Regulations that put an onus on producers of goods to cut down on the use of packaging and to encourage the reuse and recycling of materials used in packaging.

The Government has given Local Authorities targets for waste reduction, but not necessarily the resources to achieve these targets. The targets include the recycling of 25% of domestic waste and for 40% of homes with gardens to be involved with composting green waste. The average recycling rate for Local Authorities in Lancashire is 4% so it is unlikely that they will achieve the Government set target by the year 2000 and even if they did extra landfill capacity (or an alternative) would still be required.

Pressures on Waste Management

The more waste that is generated the greater the pressure on the environment. In Lancashire there is a great reliance on disposal of waste to landfill. By the year 2004 it is likely that the current landfill sites will be close to capacity and need extensions. New sites or disposal solutions will still be needed. There is a need to plan for alternatives now due to time involved in preparing and implementing plans for new landfill sites or developing new solutions such as waste to energy plants or waste sorting and recovery facilities.

Whilst there are strong incentives for businesses to reduce the amount of waste produced this is less so for the general public. There is legislation aimed at businesses to encourage less use of packaging. By embarking on a waste minimisation programme business can save money by having a smaller waste disposal bill and often due to introduction of recycling and reuse require less raw materials to produce the same amount of product. As waste minimisation can be a proven way to make a business more cost effective it becomes attractive to pursue. As this requires a change in practice, and sometimes culture, there is a need to promote waste minimisation to businesses.

The pressure for encouraging the public to become more involved in waste minimisation is more problematic as the practicalities are more difficult and incentives are less clear cut. To gain their involvement in buying goods with less packaging would require an education campaign and as there are regulations to cut down on the amount of packaging used at source this could well be a less productive use of resources.

To gain public involvement in recycling requires capital investment by local authorities which is difficult to fund, especially as the markets for recovered materials is volatile so income to offset expenditure is difficult to predict. It is unlikely that schemes would be self-financing. So the least capital intensive schemes are generally adopted which is the provision of recycling banks in public accessible car parks which is unlikely to produce recycling rates of 25% (the government target) as it is too inconvenient for the majority of people.

The increasing cost of waste disposal could also lead to a pressure of greater illegal tipping. To prevent this from happening resources are required to enforce and promote current legislation on illegal tipping.

Achievements since the first consultation report, (1995)

The first consultation report was produced by the National Rivers Authority and as such did not address waste management, since this was not in the National Rivers Authority's remit. The creation of the Environment Agency added this theme to the scope of what now are Local Environment Agency Plans.

Issues relating to waste management in the Ribble area

Issue 26 Environmental impact of fly-tipping.

Issue 27 Illegal tipping at Sansbury Quarry.

Issue 28 The environmental impact of unsustainable business practices.

ISSUE 26: ENVIRONMENTAL IMPACT OF FLY-TIPPING

Background to the issue of fly-tipping: The dumping of waste at sites other than legal waste management sites is commonly known as fly tipping. Fly tipping of waste is a common problem throughout the Ribble area. However, some areas are recognised as known hotspots, in particular the Fylde area has suffered badly for a number of years.

The waste types commonly fly-tipped have been found to include household, commercial and industrial waste. The illegal deposit of such waste can have numerous implications including pollution of land and adjacent watercourses and may present a hazard to members of the public. In addition, there have been a number of incidents where asbestos has been illegally deposited in areas to which the public has access. These deposits are of particular concern due to the potential hazards associated with asbestos.

Possible Solutions: Within the Fylde area we intend to increase monitoring and enforcement. It is hoped that by publicising these activities the problem of fly-tipping will be reduced. In addition, a memorandum of understanding with regard to fly-tipping has been agreed between the Agency and Local Authorities. Both parties will make full use of this agreement to ensure all incidences of fly-tipping are dealt with promptly and effectively.

Solutions	Responsibility	Benefit	Timescale
Option 1– Increase monitoring and enforcement.	Responsibility of the Agency and Local Authority.	Increased chance of identifying and where practicable prosecuting fly-tippers.	2000-2004.
Option 2 – Actively encourage landowners to remove fly-tipped waste, making use of appropriate legislation to enforce site clean ups where practicable.	Responsibility of the Landowner, Local Authority and the Agency in a facilitating role.	Rapid removal of fly-tipped waste, reducing the pollution risks to the environment and human health.	2000-2004.
Option 3 – Include removal of fly-tipped waste in offenders rehabilitation programmes.	The Agency and Probation Service.	Cost effective method of removing fly-tipped waste.	2000-2004.

Solutions	Responsibility	Benefit	Timescale
Option 4 – Educate local population with leaflets, press releases in local newspapers and local authority newsletters on penalties for fly-tipping.	The Agency and Local Authorities.	Improved awareness of problems caused by fly-tipping and associated penalties.	2000-2001.
Option 5 – Improve security in problem areas and where practicable restrict access.	Landowners/ The Agency.	Discourages unauthorised access and fly-tipping.	2000-2004.

Constraints: Cost of clean up may be high for landowners and cost of monitoring and enforcement will be high for the agency.

ISSUE 27: ILLEGAL TIPPING AT SANSBURY QUARRY.

Background to the issue of illegal tipping at Sansbury Quarry: The Sansbury Quarry site in Colne, East Lancashire has been operated as a landfill site without a waste management licence for over ten years. In November 1997 an uncontrolled fire started at the site, which became very deep-seated and has continued to burn underground. We took steps to control the blaze and reduce its effect on the environment and local residents. Since that time we have monitored the site closely for further signs of fire. Remedial action to compact voids caused by consumption of combustible material within the landfill has also been taken as and when necessary. We have taken enforcement action against the operator and operations at the site have now ceased. However a legacy of non-inert waste material and its associated pollution potential remains.

The remediation and restoration of the site is envisaged to be difficult and it will therefore remain as an ongoing problem for the residents of Colne and the surrounding area. We are aware that some property owners downstream of Sansbury Quarry are concerned about the impact of the site on groundwater, surface water and also the stability of the site and the aesthetic impact on the surrounding countryside. The production of landfill gas is also a potential problem.

A desk study has been carried out to assess the risk posed by illegal tipping at Sansbury Quarry on the local groundwater resource and local watercourses. Although current data and the local geological conditions suggest that there is no existing contamination or immediate threat to local abstractions, further work is required to identify any long-term threat to the groundwater resource and possible solutions to protect against contamination in the future.

Investigation of the risks associated with the site will be revised and then the site will require remedial action to overcome those risks to local residents, the amenity and to the environment. It is envisaged that this can be achieved in partnership with other responsible parties.

Solutions	Responsibility	Benefit	Timescale
Carry out an environmental risk assessment of the site.	The Agency. Landowner. LCC. Pendle Borough Council. Other interested parties to be identified.	Identify risks posed by the site so that appropriate remedial action can be identified without entailing excessive cost.	1999-2001.
Carry out any required remedial action to overcome identified risks and thus the pollution potential of the site to restore the area to a useful purpose.	The Agency. Landowner. LCC. Pendle Borough Council. Other interested parties.	The site is restored to a useful purpose and no longer poses an environmental threat to the area.	2000-2003.

ISSUE 28: THE ENVIRONMENTAL IMPACT OF UNSUSTAINABLE BUSINESS PRACTICES.

Background to the Issue: In recent years there has been increasing demands placed on companies by legislation and regulation to improve environmental performance. Consumers and supply chains are also demanding better environmental performance. We aim to support businesses to become sustainable and demonstrate that the company and the environment will benefit from this.

A company can benefit by saving money, as the amount of waste is reduced and water and fuels are used more efficiently. Establishing good environmental credentials with the public and other customers can develop an advantage in the market place, which helps to make a business more sustainable.

Developing good environmental business practices can also prevent costly pollution incidents. Most incidents of pollution originating from industrial sites and trading estates arise from accidents, negligence, poor storage and the mishandling of oil, chemicals and waste. As well as spillages, a common problem on more modern estates occurs from wrong connections to surface water drains resulting in wash waters, process effluents and contaminated yard washings all discharging to the nearest watercourse. Where industrial units have been converted from older premises and sub let, drainage systems have not usually been updated. These older systems are also more prone to blockages and leaks.

There are water quality problems associated with the following industrial estates:

- Walton Summit Industrial Estate – contaminated surface water discharges from this industrial estate contribute to water quality problems in Fowler Brook and Many Brooks.
- Whitebirk Industrial Estate – contaminated surface water discharges from this industrial estate contribute to water quality problems in the River Blakewater. North West Water Ltd have rejected our requests for a first flush surface water interceptor to be provided for this industrial estate as part of the Blackburn sewerage scheme.
- Roman Road Industrial Estate – contaminated surface water contributes to water quality problems in Daveyfield Brook.
- William Blythe Ltd at Church near Accrington – chemical manufacture has been carried out for more than 150 years. For most of that time there has been associated pollution of the adjacent watercourses, White Ash Brook and Tinker Brook and of Hyndburn Brook further downstream, by toxic metals.
- Salthill Industrial Estate – causes problems with oil and silt pollution of Mearley Brook in Clitheroe. Some wrong connections have also been identified.
- Pendle Trading Estate – This small industrial estate in Chatburn causes significant problems in Pimlico Brook. Presently the site is not served by a foul sewer, this presents a major difficulty.

Possible Solutions: Whilst all pollution incidents are investigated as a matter of urgency, the nature of these sites and the resultant pollution means that a targeted approach of on-site pollution prevention inspections and campaigning on wider issues is required.

Our approach is to develop a demonstration project at Walton Summit Business Park. This will prove that companies on an existing business park can achieve commercial benefits and environmental good practice. The support for the project can be demonstrated by the formation of a strong Steering Group, of companies and organisations (including South Ribble Borough Council, Groundwork and LCEII).

We are also working with William Blythe Ltd to prevent pollution by developing good environmental practice. The pollution at White Ash Brook, Tinker Brook and Hyndburn Brook caused the waters to fail to meet the European Dangerous Substances Directive over a length of approximately 7 km . Investigations carried out by us together with the company have successfully identified many sources of contamination from the site. The company has carried out a phased programme of works to eliminate the sources of pollution such that the length of watercourses affected has gradually reduced and the level of pollution has also declined. Currently only around 300m of watercourse is affected and we are continuing to work with William Blythe Ltd to ensure that the problem is completely resolved.

A campaign is planned in the Blackburn and Preston areas to promote Water Demand Management Systems to help reduce the need for surface and groundwater abstractions.

As examples of good practice are built up there will be further opportunities to promote and gain involvement of other companies. This will include building on the success of 'the Green light for Better Business' seminar held in Accrington in 1998, the River Valley Initiatives and Local Agenda 21.

Solutions	Responsibility	Benefit	Timescale
Continue to develop Walton Summit Green Business Park.	The Agency with the Steering Group.	Develops Environmental Management Systems good practice.	Next five years.
Promote good practice. Identify and rectify any site drainage problems and site contamination including remediation where appropriate. Promote good house keeping sites.	The Agency, Owners/ Occupiers, Local Authority and North West Water Ltd.	Improved water quality and improved aesthetics. Contribute to compliance with water quality objectives. Reduce health risk implications.	Next five years.
Water Management campaign in Blackburn and Pendle.	The Agency.	Protection of water resource of area.	1999-2001.

Constraints: Cost implications to Owners/Occupiers and North West Water Ltd.
High turnover of occupants on industrial estates may mean that education campaigns miss people or in some cases only have a short-term impact.

The State of Air Quality in the Ribble Area.

The Environment Act 1995 provides a framework within which local authorities have responsibility for the overall management of local air quality. This Act requires Government to publish a national strategy for air quality, which sets a framework of standards, and objectives for the pollutants of most concern to human health. The National Air Quality Strategy was published in 1997 and outlines the steps that the Government is taking, and the measures it expects others to take, to see that air quality objectives are met. The Agency will be working closely with the local authorities to help achieve the objectives.

Air quality needs to be measured and improved in order to provide a better quality of life for people and to protect health and the environment. There are indications that airborne pollution is associated with asthma and other chronic illnesses. Emissions of air pollutants may also contribute to the build-up of greenhouse gases (see section 8) and some result in acid rain, which causes damage to buildings, vegetation, trees and aquatic life.

The main air pollutants such as benzene, carbon monoxide, lead, nitrogen dioxide, PM10s, ozone and sulphur dioxide commonly find their way into the atmosphere as a result of combustion of fossil fuels and, in particular, the use of petrol and diesel by industry and vehicles.

Due to increasingly stringent legislation and regulation the current trend is for air pollution to be on the decrease. Whilst some areas of the North West do suffer from acid rain this does not appear to be a problem in the Ribble area. Lead pollution is also now less of a problem due to the introduction of lead-free petrol.

The Pressures on Air Quality in the Ribble Area

The introduction of the National Air Quality Strategy has set targets for air quality and helped Local Authorities and us to effectively regulate the emissions from industries. However, increasing car ownership and the trend of people travelling greater distances to work is likely to reverse the current trend and lead to increase air pollution in the first decade of the new millennia.

Achievements since the first consultation report, (1995)

The first consultation report was produced by the former National Rivers Authority and as such did not address air quality. The creation of the Environment Agency added this theme to the scope of what now are Local Environment Agency Plans.

Climate Change and the Ribble Area

Climate change is a global concern. However, it is all the local processes that contribute to make climate change a global concern.

There is a consensus amongst scientists internationally that human activities mainly connected with energy generation, transport and agriculture are contributing to a rising global temperature. This is often referred to as the 'GreenHouse' effect. The chemicals causing the effect are then referred to as the 'Greenhouse gases'; these include carbon dioxide, methane, nitrous oxides and CFC's.

Achievements since the first consultation report, (1995)

The first consultation report was produced by the former National Rivers Authority and as such did not address climate change. The creation of the Environment Agency added this theme to the scope of what now are Local Environment Agency Plans.

Issues within the scope of the Local Environment Agency Plan that relates to Climate Change

Issue 29 The utilisation of waste for energy to reduce emissions to the environment from landfill sites.

ISSUE 29: THE UTILISATION OF WASTE FOR ENERGY TO REDUCE EMISSIONS TO THE ENVIRONMENT FROM LANDFILL SITES.

Background to the Issue: As waste breaks down in a landfill site it can generate landfill gas, which is mainly methane. The gas can build up within the site. There are various methods of dealing with the build up of gas, from simple venting to burning it to produce energy.

If sufficient levels of landfill gas are present then its burning as a fuel has several benefits. It turns waste into something useful, this is a good sustainable practice. It also turns the methane into carbon dioxide; this has less effect on Global Warming.

To encourage the use of landfill gas as a fuel the Non-Fossil Fuel Obligation (NFFO) scheme allows preferential rates to be paid for energy produced in this way.

The landfill site at Clifton Marsh near Freckleton is currently aiming to install an energy recovery plant on site.

If the quantity of landfill gas produced is insufficient for energy recovery, then flaring of the gas is likely to be the most attractive management option. Whilst no usable energy is produced, the potential impact on global warming is reduced by conversion of methane to carbon dioxide. A gas-flaring scheme is due to be installed at Henthorne Road landfill site near Accrington.

We aim to encourage schemes such as those described above and help to promote schemes at other landfill sites where gas production rates are conducive to such recovery schemes.

Solutions	Responsibility	Benefit	Timescale
Implement gas extraction and energy recovery at Clifton Marsh.	LWS.	Sustainable resource management. Reduced global warming potential. Non-fossil fuel contribution to energy.	
Implement gas flaring at Henthorne Road.	LWS.	Reduced global warming potential.	1999-2004.
Encourage gas extraction and recovery, where feasible, at other waste management sites.	The Agency. Site Operators.	Reduced global warming potential.	

Regulating Major Industries

We aim to ensure that air, water and land are not harmed by the industries that we regulate in the Ribble area. By working in partnership with these organisations we set common goals and achieve agreed targets that are consistent with sustainable development and the legal framework. It is hoped that this approach achieves firm, fair and consistent standards of regulation that enables the public to have confidence that industry is effectively regulated.

Even when industry is well regulated and not having an adverse impact upon the environment there can still be some concerns amongst the public. Where these concerns exists we aim to demonstrate that our regulation is effective and that the environment is protected.

We are also going beyond the role of just that of regulator by working with industries to enable them to develop good environmental management practice. This approach includes developing partnership projects to promote the benefits of good environmental management practice. These benefits include more efficient use of resources and reducing the likelihood of pollution incidents. These contribute to economic savings and competitive advantage. 'Walton Summit Green Business Park' and the Water Demand Management Campaign, (discussed as Issue 28), will be developed to promote these benefits to a wider audience.

Another example of this proactive approach is British Aerospace who are currently embarking on a 3Es initiative, on the cadmium plating process at their Samlesbury site. The 3Es methodology offers a structured approach to achieving improved environmental performance through process optimisation.

Over the next year the company will be involved in reviewing their process in a systematic way, with a view to identifying and implementing long term improvements. These improvements will have the potential to reduce Emissions, improve Efficiency and provide Economic benefits for the company.

This initiative is the first of its kind within the Central area.

ISSUE 30: PUBLIC CONCERN REGARDING AIR QUALITY IN THE OSWALDTWISTLE AREA.

The Issue in the Oswaldtwistle Area: There are concerns amongst residents in the Oswaldtwistle area relating to the impact of releases from Nipa Laboratories on air quality.

Background to the Issue in the Oswaldtwistle Area: Nipa Laboratories in Oswaldtwistle is one of the major industries regulated by the Environment Agency in the Ribble LEAP area. Nipa manufactures biocides (anti-bacterial agents and molds suppressants). There have been a number of unauthorised releases from Nipa Laboratories, Oswaldtwistle, which has caused alarm to the residents around the area.

Possible Solution: We will continue to monitor and regulate the site in a rigorous but fair way, having regard to all of our statutory duties and responsibilities. We will regulate in an open and transparent way and actively seek opportunities for continuous environmental improvement. We will seek to ensure that procedures are in place, on the site, to reduce insofar as is reasonably practicable, the number of unauthorised releases. To this end a major site audit was carried out in February 1999 at Nipa Laboratories, Oswaldtwistle. A detailed report will be issued this year.

Solutions	Responsibility	Benefit	Timescale
Make the report available to the public on the findings of the audit. Seek improvements on the site.	The Agency, Nipa Laboratories.	Raise public awareness and continue environmental improvements.	

ISSUE 31: PUBLIC CONCERN REGARDING AIR QUALITY IN THE CLITHEROE AREA.

The Issue in the Clitheroe Area: There are concerns amongst the residents in the Clitheroe and surrounding areas relating to the impact of releases from Castle Cement Ltd on local air quality.

Background to the Issue in the Clitheroe Area: A part of the community in the Clitheroe area of Lancashire has expressed concerns relating to the operation of a cement manufacturing process on the outskirts of Clitheroe town. Concerns have generally related to the possibility of links between releases to air from Castle Cement Ltd and human health effects. Castle Cement Ltd is one of several important sites for us in the Ribble LEAP area. Work carried out by the Agency and its predecessor's in partnership with Ribble Valley Borough Council and East Lancashire Health Authority has not demonstrated a link between the releases from the site and health effects. The Area Environment Group, an independent advisory body, specifically looked at the issues surrounding the regulation of Castle Cement Ltd. The group reported that 'There are good indications that during the working group's deliberations, which have extended over 15 months, the environmental conditions in the area surrounding the Castle Cement plant have improved'.

Possible Solution: We will continue to monitor and regulate the site in a rigorous but fair way, having regard to all of our statutory duties and responsibilities. We will regulate in an open and transparent way and actively seek opportunities for continuous environmental improvement. We will continue to seek to improve communications with the local communities and their elected representatives. We will seek to raise public awareness of improvements on site.

Solutions	Responsibility	Benefit	Timescale
Raise Awareness of regulatory activities and environmental improvements.	Environment Agency, Castle Cement, Ribble Valley Borough Council.	Improved links between the community and the Environment Agency.	

APPENDIX 1 – WATER QUALITY

The Agency uses two principal schemes for the reporting and management of river water quality: the General Quality Assessment (GQA) scheme and the Water Quality Objectives (WQOs) scheme. These schemes replaced the National Water Council (NWC) water quality classification system that was used prior to 1994. In addition, there a number of EC Directives that have implications for water quality.

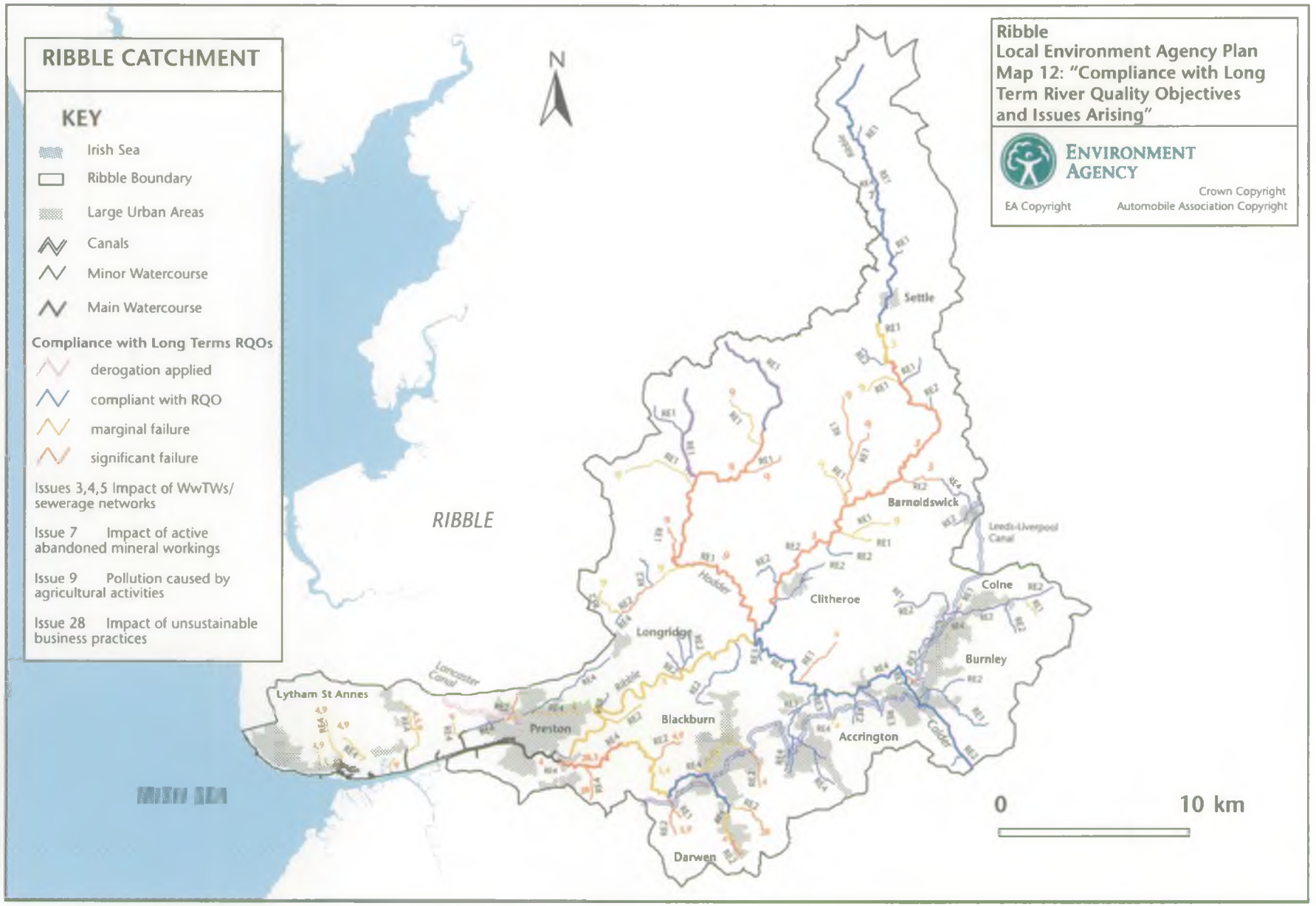
General Quality Assessment and Statutory Water Quality Objectives

The GQA scheme is used to make periodic assessments of the quality of river water in order to monitor geographical and temporal trends. The scheme as presently envisaged will comprise four components – general chemistry, nutrients, aesthetics and biology – each providing a discrete 'window' upon the quality of river stretches. The general chemistry and biology components of the GQA scheme are in current use for all classified rivers and canals. The remaining two windows are still being developed.

The WQO scheme establishes clear quality targets to provide a commonly agreed planning framework for regulatory bodies and dischargers alike. The WQO scheme is based upon the recognised uses to which a river stretch may be put. Standards defining the five-tiered River Ecosystem (RE) use classes, which address the chemical quality requirements of different types of aquatic ecosystems, were introduced by *The Surface Waters (River Ecosystem) Classification Regulations 1994*. Standards for the other uses are under development.

River Water Quality Objectives (RQOs) for classified rivers and canals in the Ribble LEAP area were set following a period of public consultation carried out by the former National Rivers Authority in the period March to November 1995. This is discussed further below.

The GQA and WQO schemes are initially being applied only to Rivers and Canals. Schemes for other controlled waters are also under consideration. Tidal Waters and Estuaries are presently still classified using the National Water Council (NWC) scheme which considers dissolved oxygen, aesthetic quality and biological quality and places water quality into one of four classes.


RIBBLE CATCHMENT
KEY
Irish Sea
Ribble Boundary
Large Urban Areas
Canals
Minor Watercourse
Main Watercourse
Compliance with Long Terms RQOs
derogation applied
compliant with RQO
marginal failure
significant failure
Issues 3,4,5 Impact of WwTWs/ sewerage networks
Issue 7 Impact of active abandoned mineral workings
Issue 9 Pollution caused by agricultural activities
Issue 28 Impact of unsustainable business practices
N
RIBBLE
IRISH SEA
Ribble
Local Environment Agency Plan
Map 12: "Compliance with Long Term River Quality Objectives and Issues Arising"
ENVIRONMENT AGENCY
Crown Copyright
EA Copyright
Automobile Association Copyright
Settle
Barnoldswick
Leeds-Liverpool Canal
Colne
Clitheroe
Longridge
Burnley
Lancaster Canal
Lytham St Annes
Preston
Blackburn
Accrington
Darwen
0
10 km

River Quality Objectives (RQOs) for the Ribble LEAP Area

Table 1 – Descriptions for the five River Ecosystem Classes

RE Class	Description
RE 1	Water of very good quality suitable for all fish species.
RE 2	Water of good quality suitable for all fish species.
RE 3	Water of fair quality suitable for high class coarse fish populations.
RE 4	Water of fair quality suitable for coarse fish populations.
RE 5	Water of poor quality which is likely to limit coarse fish populations.

N.B. Waters not achieving class RE 5 is of bad quality in which fish are unlikely to be present.

River Quality Objectives in terms of River Ecosystem classes for the Ribble LEAP area were first proposed in the Ribble Catchment Management Plan March 1995 Consultation Report and subsequently confirmed in the November 1995 Action Plan. These objectives were proposed following examination of water quality data for the period 1991 to 1993, a 'neutral' translation of the former NWC Class river quality objectives set via public consultation in 1979, and consideration of improvements that were envisaged at that time.

Between 1994 and 1996 many parts of the country experienced a significant drought. Deterioration in water quality was observed in some reaches as a result of reduced river flows. In some cases water quality has not yet returned to its pre-drought condition. On the other hand a number of sewerage improvement schemes have recently been completed by North West Water Ltd and in addition the performance of certain waste water treatment works has improved resulting in some expected and some unexpected improvements in water quality.

53.1% (288 km) of the classified rivers and canals in the Ribble LEAP area are presently complying with their long term river quality objective with 21.0% (140 km) significantly failing and 25.9% (114 km) marginally failing to meet their long term objective. The Agency's National target is to reduce non-compliance with river quality objectives to 10% by 2005 (this applies to the significant failures, i.e. those failures where we are at least 95% certain that water quality is failing to meet its objective).

The full set of short to medium term and long term RQOs that were set in 1995 and details of present compliance are tabulated on the next six pages.

Table 2 – Ribble LEAP River Quality Objectives

River/Canal	Reach	RQO Short Term	RQO Long Term	Status
Ribble	Calder to FWL	RE3	RE2	Marginal Failure to meet RE3 (pH)
Ribble	Hodder to Calder	RE2	RE2	Marginal Failure to meet RE2 (pH)
Ribble	Clitheroe STW to Hodder	RE2	RE2	Compliant with RE2
Ribble	Stock Beck to Clitheroe STW	RE2 (2000)	RE2	Significant Failure to meet RE2 (pH)
Ribble	Rathmell Beck to Stock Beck	RE2 (2000)	RE1	Significant failure to meet RE2 (pH)
Ribble	Settle STW to Rathmell Beck	RE2	RE1	Compliant with RE2 Marginal Failure to meet RE1 (BOD)
Ribble	QSL at High Bridge to Settle STW	RE1 (2000)	RE1	Compliant with RE1
Main Drain	QSL Lower Ballam Bridge to FWL at A584	RE4 (2000)	RE4	Marginal Failure to meet RE4 (BOD, dissolved oxygen)
Wrea Brook	QSL Moss Side Villa to FWL at A584	RE4 (2000)	RE4	Marginal Failure to meet RE4 (BOD)
Liggard Brook	QSL Watch Wood to FWL at A584	RE4 (2000)	RE4	Marginal Failure to meet RE4
Pool Stream	QSL Warton Airfield Culvert to FWL	RE4 (2000)	RE4	Marginal Failure to meet RE4
Leeds/Liverpool Canal	Johnsons Hillock to Rishton	RE3	RE3	Compliant with RE3
Leeds/Liverpool Canal	Rishton to Blakey Hall	RE3	RE3	Compliant with RE3
Leeds/Liverpool Canal	Blakey Hall to QSL Greenberfield Lock	RE3	RE3	Compliant with RE3
Dow Brook	Below Newton to FWL at Freckleton	RE5	RE4	Compliant with RE5 Marginal Failure to meet RE4 (BOD)
Dow Brook	QSL at Spen Brook to below Newton	RE5	RE4	Compliant with RE5 Marginal Failure to meet RE4 (BOD)
Savick Brook	Sharoe Brook to FWL	RE4 (2000)	RE4	Compliant with RE4
Savick Brook	Railway Crossing to Sharoe Brook	RE4	RE4	Marginal Failure to meet RE4
Savick Brook	Grimsargh Rd Bridge to Railway Crossing	RE4 (2000)	RE4	Compliant with RE4
Savick Brook	QSL at Shay Lane I.E. to Grimsargh Bridge	RE4	RE4	Compliant with RE4

River/Canal	Reach	RQO Short Term	RQO Long Term	Status
Deepdale Brook	QSL at BNFL Springfields to Savick Brook	BK.RE4 (2000)	RE4	Marginal Failure to meet RE4 (ammonia)
Sharoe Brook	QSL Preston/Lancaster Railway to Savick Brook	RE2	RE2	Significant Failure to meet RE2 (BOD, ammonia)
Eaves Brook	QSL at Red Scar I.E. to Savick Brook	RE4 (2000)	RE4	Marginal Failure to meet RE4 (BOD)
Darwen	Hole Brook to FWL(A6)	No class	RE4	Significant Failure to meet RE4 (BOD)
Darwen	Roddlesworth to Hole Brook	RE4	RE4	Marginal Failure to meet RE4 (BOD)
Darwen	Darwen STW Storm Tanks to Roddlesworth	RE4	RE4	Compliant with RE4
Darwen	Hardman Way to Darwen STW Storm Tanks	RE4	RE4	Marginal Failure to meet RE4 (BOD)
Darwen	QSL Watery Lane to Bold Venture Brook	RE3	RE2	Significant Failure to meet RE3 (BOD)
Hennel Brook	QSL Duddel Lane to Darwen	RE4 (2000)	RE4	Significant Failure to meet RE4 (BOD)
Many Brooks	QSL Drum Head to confluence with Darwen	RE4 (2000)	RE4	Significant Failure to meet RE4 (BOD)
Fowler Brook	QSL at Walton Summit I.E. to Many Brooks	RE4	RE4	Significant Failure to meet RE4 (BOD)
Hole Brook	QSL at Blackburn STW O/F to Darwen	No class	RE4	Significant Failure to meet RE4 (BOD, ammonia)
Alum Brook	QSL Arley Brook to Darwen	RE2 (2000)	RE2	Significant Failure to meet RE2 (BOD)
Roddlesworth	Star Paper Mill to Darwen	RE2 (1995)	RE2	Significant Failure to meet RE2 (BOD)
Roddlesworth	QSL Withnell to Star Paper Mill	RE2	RE2	Significant Failure to meet RE2 (BOD)
Stock Clough	QSL Shaw Brook to Roddlesworth	RE1	RE1	Significant Failure to meet RE1 (BOD)
Blakewater	QSL at Whitebirk I.E. to Darwen	RE4 (2000)	RE4	Marginal Failure to meet RE4
Knuzden Brook	QSL at B6231 to Blakewater	RE3 (2000)	RE2	Marginal Failure to meet RE3 (BOD) Significant Failure to meet RE2 (BOD, Copper)
Davyfield Brook	Roman Rd to Darwen	RE2	RE2 (2000)	Marginal Failure to meet RE2 (BOD)
Davyfield Brook	QSL at Hoddlesden Reservoir to Roman Rd	RE2	RE2	Significant Failure to meet RE2 (BOD)
Bezza Brook	QSL Daisy Hill to confluence with Ribble	RE2	RE2	Marginal Failure to meet RE2 (BOD)

River/Canal	Reach	RQO Short Term	RQO Long Term	Status
Tun Brook	QSL Tun Brook Wood to Ribble	RE4	RE4	Compliant with RE4
Duddel Brook	QSL at B6243 to Ribble	RE2 (2000)	RE2	Compliant with RE2
Boyces Brook	QSL at Buckley Hall to Duddel Brook	RE2	RE2	Compliant with RE2
Stydd Brook	QSL at B6243 to Duddel Brook	RE2	RE2	Compliant with RE2
Showley Brook	QSL at Wilpshire STW to Ribble	RE2 (2000)	RE2	Compliant with RE2
Calder	Whalley Weir to Ribble	RE5	RE4	Compliant with RE5 Compliant with RE4
Calder	Hyndburn Brook to Whalley Weir	RE5	RE4	Compliant with RE5 Compliant with RE4
Calder	Padiham Power Station to Hyndburn Brook	RE5	RE4	Compliant with RE5 Compliant with RE4
Calder	Pendle Water to Padiham Power Station	RE5	RE4	Compliant with RE5 Compliant with RE4
Calder	Brun to Pendle Water	RE3	RE3	Compliant with RE3
Calder	Everage Clough Towneley to Brun	RE2	RE2	Compliant with RE2
Calder	Easden Clough to Everage Clough Towneley	RE2	RE2	Compliant with RE2
Calder	Black Clough to Easden Clough	RE2	RE2	Compliant with RE2
Calder	QSL Copy Pit to Black Clough	RE2	RE2	Compliant with RE2
Bushburn Brook	QSL Tom Ingham Wood to Calder	RE3	RE3	Compliant with RE3
Sabden Brook	QSL Victoria Mill Sabden to Calder	RE2	RE1	Compliant with RE2 Significant Failure to meet RE1 (BOD)
Hyndburn Brook	Hyndburn To Calder	RE3	RE3	Compliant with RE3
Hyndburn Brook	White Ash Brook to Hyndburn	RE4 (2000)	RE4	Compliant with RE4
Hyndburn (Tinker) Brook	Below A679 to White Ash Brook	RE4 (2000)	RE4	Compliant with RE4
Hyndburn (Tinker) Brook	QSL Whams Brook to below A679	RE2 (2000)	RE2	Compliant with RE2
Norden Brook	QSL Church Bridge to Hyndburn Brook	RE3	RE3	Compliant with RE3
Hyndburn	QSL Broad Oak Water to Hyndburn Brook	RE4	RE4	Compliant with RE4

River/Canal	Reach	RQO Short Term	RQO Long Term	Status
Wood Nook Water	QSL Tom Dale Clough to Hyndburn	RE4	RE4	Compliant with RE4
White Ash Brook	QSL Stanhill Bridge to Tinker Brook	RE4 (2000)	RE4	Compliant with RE4
Clough Brook	Head O'th Town to Calder	RE3	RE3	Compliant with RE3
Clough Brook	QSL Huncoat STW to Head O'th Town	RE4 (2000)	RE3	Compliant with RE4 Marginal Failure to meet RE3 (BOD)
Castle Clough	QSL Mill Hill Lane to Calder	RE2	RE2	Compliant with RE2
Green Brook	QSL at Hapton Colliery to Calder	RE3	RE3	Compliant with RE3
Pendle Water	Colne Water to Calder	RE3	RE3	Compliant with RE3
Pendle Water	QSL at Lower Ogden Reservoir to Colne Water	RE2	RE2	Compliant with RE3
Walverden Water	QSL Marsden Brook to Pendle Water	RE4	RE4	Marginal Failure to meet RE4 (BOD)
Colne Water	Colne STW to Pendle Water	RE4	RE4	Compliant with RE4
Colne Water	Church Clough to Colne STW	RE2	RE2	Compliant with RE2
Colne Water (Laneshaw)	QSL at Laneshaw Reservoir to Church Clough	RE2 (2000)	RE2	Compliant with RE2
Wanless Water	QSL B6247 to Colne Water	RE2	RE1	Compliant with RE2 Significant Failure to meet RE1 (BOD)
Trawden Brook	QSL Hollins Hall Mill to Colne Water	RE2	RE2	Compliant with RE2
Wycoller Beck	QSL Wycoller Hall to Laneshaw	RE1	RE1	Marginal Failure to meet RE1 (BOD)
Barley Water	QSL Barley to Pendle Water	RE2	RE1	Compliant with RE2 Marginal Failure to meet RE1 (BOD)
Barden Clough Brook	QSL Old Gasworks to Calder	RE4	RE4	Significant Failure to meet RE4 (Copper)
Brun	Don to Calder	RE2	RE2	Compliant with RE2
Brun	Worsthorne STW to Don	RE2	RE2	Compliant with RE2
Brun	QSL Cant Clough Reservoir to Worsthorne STW	RE1	RE1	Compliant with RE1
Don	QSL at Northbank to Brun	RE2	RE2	Compliant with RE2
Black Clough	QSL Deerplay Pit Adit to Calder	RE2	RE2	Compliant with RE2

River/Canal	Reach	RQO Short Term	RQO Long Term	Status
Hodder	Barn Gill to Ribble	RE1	RE1	Compliant with RE2 Significant Failure to meet RE1 (BOD)
Hodder	Stocks WIP to Barn Gill	RE2	RE2	Compliant with RE2
Hodder	QSL Red Syke to Stocks WIP	RE1	RE1	Compliant with RE1 (derogation for pH)
Loud	Chipping Brook to Hodder	RE2	RE2	Marginal Failure to meet RE2 (BOD)
Loud	Higgin Brook to Chipping Brook	RE3	RE2	Compliant with RE3 Significant Failure to meet RE2 (BOD)
Loud	QSL at Higher Bridge to Higgin Brook	RE3	RE2	Compliant with RE3 Marginal Failure to meet RE2 (BOD)
Chipping Brook	QSL Dobsons Brook to Loud	RE2	RE2	Compliant with RE2
Higgin Brook	QSL at Cockleach to Loud	RE4	RE4	Compliant with RE4
Greystoneley Brook	QSL Rathera Clough to Hodder	RE1	RE1	Significant Failure to meet RE1 (BOD)
Langden Brook	Trout Hatchery to Hodder	RE1	RE1	Marginal Failure to meet RE1 (BOD)
Langden Brook	QSL Bleasdale Water to Trout Hatchery	RE1	RE1	Marginal Failure to meet RE1 (BOD)
Dunsop	Brennand to Hodder	RE1 (2000)	RE1	Compliant with RE1
Dunsop	QSL Folds Clough to Brennand	RE1	RE1	Compliant with RE1 (derogation for pH)
Brennand	QSL Round Hill Water to Dunsop	RE1	RE1	Compliant with RE1
Easington Brook	QSL Langcliffe Cross Brook to Hodder	RE1	RE1	Significant Failure to meet RE1 (BOD)
Croasdale Beck	QSL Fox Clough to Hodder	RE1	RE1	Marginal Failure to meet RE1 (BOD)
Mearley Brook	QSL at Tower Hill to Ribble	RE3	RE3	Compliant with RE3
Pimlico Brook	QSL at Chatburn I.E. to Mearley Brook	RE2	RE2	Compliant with RE2
Bashall Brook	QSL Bashall Hall to Ribble	RE2	RE2	Compliant with RE2
Chatburn (Heys) Brook	Railway Bridge to Ribble	RE2	RE2	Compliant with RE2
Chatburn (Heys) Brook	QSL Downham to Railway Bridge	RE2	RE2	Compliant with RE2
Swanside Beck Brook	QSL Eel Beck to Ribble	RE1	RE1	Marginal Failure to meet RE1 (BOD)

River/Canal	Reach	RQO Short Term	RQO Long Term	Status
Ings Beck	QSL Twiston Beck to Swanside Beck	RE1 (2000)	RE1	Marginal Failure to meet RE1 (BOD)
Skirden Beck	QSL B6478 to Ribble	RE1 (2000)	RE1	Significant Failure to meet RE1 (BOD, dissolved oxygen)
Holden Beck	QSL at Fell Beck to Skirden Beck	RE1	RE1	Marginal Failure
Monubent Beck	QSL at Hen Gill to Skirden Beck	RE1	RE1	Significant Failure
Stock Beck	Horton Bridge to Ribble	RE5	RE2	Compliant with RE5, RE4 and RE3 Significant Failure to meet RE2 (BOD)
Stock Beck	Bracewell to Horton Bridge	RE5	RE4	Compliant with RE5 and RE4
Stock Beck	Barnoldswick STW to Bracewell	RE5	RE4	Compliant with RE5 and RE4
Stock Beck	QSL at Springs to Barnoldswick STW	RE3	RE2	Compliant with RE3 and RE2
Pan Beck	QSL A682 to Ribble	RE2	RE2	Compliant with RE2
Long Preston Beck	QSL Bookil Gill Beck to Ribble	RE1	RE1	Compliant with RE1
Wigglesworth Beck	QSL Tod Holes Hill to Ribble	RE1	RE1	Marginal Failure to meet RE1 (BOD)
Rathmell Beck	QSL Heasley Beck to Ribble	RE2	RE2	Compliant with RE2
Stainforth Beck	QSL Tongue Gill to Ribble	RE1	RE1	Compliant with RE1 RE4 (pH)
Whit Beck	QSL Railway Crossing to Ribble	RE5	RE4	Compliant with RE5 significant failure to meet RE4 (pH)
Cam Beck	QSL Brow Gill Beck to Ribble	RE1	RE1	Compliant with RE1
Lancaster Canal – Preston	QSL Maudlands Preston to to Swilebrook	RE4	RE4	Compliant with RE4 (derogation for Summer BODS)

EC Directives – Water Quality Designations in the Ribble LEAP Area

Significant designations under EC Directives in relation to the issues raised in this LEAP document are shown on **Map 5**. The following EC Directives contain standards and water quality objectives that have implications for water quality within the Ribble LEAP area:

The Dangerous Substances Directive (76/464/EEC). This is concerned with controlling pollution caused by discharges of dangerous substances.

The Bathing Water Directive (76/160/EEC). This sets Environmental Quality Standards (EQSs) for designated waters that are used for bathing.

The Freshwater Fisheries Directive (78/659/EEC). This sets Environmental Quality Standards (EQSs) for stretches of waters that are designated as being suitable for salmonid or cyprinid fisheries.

The Urban Wastewater Treatment Directive (91/271/EEC). This specifies requirements for the collection and treatment of industrial and domestic waste waters at urban wastewater treatment works and for treatment of wastewater from certain types of industry prior to direct discharge to watercourse.

The Surface Water Abstraction Directive (75/440/EEC). This specifies specific standards for the quality of raw waters abstracted for use as drinking water.

APPENDIX 2 – EXTRACT OF THE SALMON ACTION PLAN – CONSULTATION REPORT

Issues and Proposed Actions.

No	Issue	Limiting Factors	Options	Responsibility		Estimated Cost	Duration of Action					
				Lead	Other		98	99	00	01	02	Future
1.	Farming.	Impact of land drainage on river flows and siltation.	Where appropriate carry out intensive surveys and ecological monitoring to identify and quantify inputs.	Agency.	LU Tech help.	Approximately £2,000 pa.	....	....	....	....	....	.....
		Impact of slurry and chemical fertilisers. Impact of cattle access and poaching of banks.	Continue farm inspections and where necessary carry out farm pollution control plans to identify and pollution.	Agency. Farmers.	MAFF. MSE.	EP Lead Approximately £10,000 pa.	---	---				
		Impact of synthetic pyrethroid sheep dips.	Promote sustainable/best management practices including campaign on environmental effects of sheep dips.	Agency. FWAG.								
2.	Lack of data on in-river populations.	Information needed on:	Continue gathering accurate counter data.	Agency.		Approximately £5,000 pa.	....	....	....	....	....	.....
		Run sizes at fish counters.										
		Rod catches below fish counter sites.	Analysis of declared catch returns and log books.	Agency.	RFA AC's.	Approximately £1,00 pa.	....	....	....	....	....	.....
		Exploitation rates by rods and nets.	Analysis of counter and catch data.	Agency.		Approximately £1,000 pa.	....	....	....	....	....	.....
		Juvenile population densities.	Electric fishing survey of spawning and nursery habitat.	Agency.		Approximately £20,000	....	....	....	....	....	.....
		Stock composition. deposition.	Programme of trapping twice a month at Waddow weir during season. Analysis of scale samples from trap, rods and nets.	Agency.	RFA AC's	Approximately £5,000 pa.	....	....	....	....	....	.....
		Salmon egg deposition.	Use of data gathered above.	Agency.		Minimal.	....	....	....	....	....	.....

No	Issue	Limiting Factors	Options	Responsibility		Estimated Cost	Duration of Action					
				Lead	Other		98	99	00	01	02	Future
3.	In-river obstructions.	Man made obstructions prevent successful migration.	At least a dozen known weirs and intakes present in the catchment without suitable fish passes. Weirs on the River Calder prevent access to 100 hectares of habitat.	Agency RCCT.	EAGGF 5b fund.	From approximately £2,000 to £60,000.	....	....	....	....	....	.....
		In-river blockages by fallen trees.	Over eighty known blockages impede access to spawning and nursery grounds.	Agency.		Solution dependant.	....	....	....	....	....	.....
4.	Low flows.	Abstraction by North West Water Ltd and agriculture, particularly in River Hodder system.	Reduce any further abstractions and review existing abstractions.	Agency.		Solution dependant.	....	....	....	....	....	.....
			Discussions with NWW concerning review of abstractions within NWW Hodder system currently on-going	Agency.		Minimal.	....	....	....	....	....	.....
5.	Exploitation by rods and nets.	Lack of spawning fish results in failing egg deposition rate.	Reduce net catch by changes to concerning review of abstractions gear, season, times of operation or Net Limitation Order.	Agency.		Up to £70,000	....	....	....	....	....	.....
			Reduce rod catch by bag limits, catch and release or byelaws to change length of season or fishing method.	Agency.	AC's		....	....	....	....	....	.....
6.	Lack of juvenile habitat.	Poor riparian vegetation leading to degradation of bankside habitat, accelerated rates of erosion and siltation, and reduced visual, wildlife and fisheries value.	300km of fencing, 75 km tree concerning review of abstractions planting and 15 km erosion control identified. Increase tree and bankside vegetation by:							....	....	.....
			Collaborative works following bid for European monies.	Agency. RCCT.	AC'S RFA.	Bid in excess of £1 million.	---	---	---	---		
			Sustainable Rivers Management Project to promote fencing and creation of mature bankside vegetation.	FWAG Agency.	RO MAFF AC's.	£25,000 pa.	---	---	---		...	

No	Issue	Limiting Factors	Options	Responsibility		Estimated Cost	Duration of Action					
				Lead	Other		98	99	00	01	02	Future
6.	Lack of juvenile habitat (cont.)	Lack of or damage to in-river spawning and nursery habitat.	Cleaning of gravels and in river improvements in conjunction with work parties from angling clubs.	Agency. RFA. AC's.		Advice manpower/ supervision.	....	....	....	....	....	.....
			Advice and contributions to angling clubs concerning in-river works.	Agency.		Advice from Agency officer.	....	....	....	....	....	.....
7.	High seas and Irish drift net fisheries.	Marine exploitation rate of River Ribble stock unknown.	Continue to monitor with national microtagging programme particularly to assess the impact of the Irish Drift Net fishery following recent constraints imposed on this fishery.	Agency. MAFF.		No direct cost to the Ribble.	....	....	....	....	....	.....
8.	Avian predation on juveniles	Populations impacted by increased levels of predation by goosanders and cormorants.	River Ribble is part of National research programmes. Await guidance following completion of project.	MAFF.	Agency RSPB	£1 million (Nationally).	---	---				
9.	Salmon poaching.	Uncontrolled illegal fishing could seriously reduce numbers spawning.	Continue to operate effective enforcement measures including Anti-poaching patrols and targeting outlets buying poached fish.	Agency.		Approximately £30,000 pa on Ribble anti-poaching.	....	....	....	....	....	.....
10.	Spring salmon.	Unknown if stock component still present.	Collect and analyse available data from clubs.	AC's. Agency.		Data analysis and report.	---	---				
			If present identify spawning and nursery areas for protection.	Agency. AC's.		Approximately £5,000.	---	---	---	---		
11.	Salmon tainting	Unknown if problem still present in Ribble stocks.	Collect information from anglers/ netsmen on continuing problem.	Agency. AC's.	RFA.	Minimal.	---	---	---			
			Continue project to identify sources.	Agency.	RFA.	Up to £50,000.	---	---	---	---	---	

APPENDIX 3 – GLOSSARY

ABSTRACTION LICENCE

Licence to abstract water from a surface or underground source. The maximum annual, daily and hourly abstraction rates are set by the licence.

AMP – Asset Management Plan

AMP2 is the second set of Asset Management Plans produced by Water Companies. The Plans cover the Water Companies' known investment of existing and other obligations (such as the operation and maintenance of existing water and wastewater systems) for the five year period 1995 to 2000. The Environment Agency is involved in setting priorities for work necessary for environmental improvements within allowed expenditure limits. Prices are controlled by an independent regulator, the Director General of Water Services (OFWAT). AMP 3 follows as the next planning period 2000 to 2005.

AONB

Area of Outstanding Natural Beauty, notified by the Countryside Agency.

BOD

Biochemical Oxygen Demand. A measure of the polluting potential.

COARSE FISH

See FRESHWATER FISH, CYPRINIDS AND SALMONIDS.

CONSUMPTIVE USE

Water which is abstracted but not returned to the catchment, either because it evaporates (as in spray irrigation) or is exported for use in another catchment.

COUNTY STRUCTURE PLANS

Statutory documents produced by County Councils outlining their strategy for development over a 10-15 year timescale.

CYPRINIDS

Fish of the carp family. (See also COARSE FISH, FRESHWATER FISH and SALMONIDS).

EFFECTIVE RAINFALL

Total rainfall minus direct evaporation and the water used by plants for transpiration. This is equivalent to the total resource of a catchment.

EIFAC

The European Inland Fisheries Advisory Commission, an Agency of the United Nations Food and Agriculture Organisation (FAO).

EUTROPHICATION

The enrichment of waters by nutrients, especially compounds of nitrogen and phosphorus. This causes an accelerated growth of algae and other plants which replace the plants and animals that would normally be found there.

FISH AGE

0+ - less than 1 year. >0+ - more than one year.

FLOW MEASUREMENT UNITS

m3/s	Cubic metres per second.
l/s	Litres per second.
Ml/d	Megalitres per day. A megalitre is equivalent to a ten metre cube (approximates to a 4-bedroom detached house).
mg/d	Millions of gallons per day.

Flow Conversion Table

m3/s	Ml/d	mg/d
0.012	1	0.224
0.06	5	1.12
0.12	10	2.24
0.24	20	4.48
0.60	50	11.2
1.20	100	22.4

FRESHWATER FISH

For the purposes of the Salmon and Freshwater Fisheries Act 1975, fish other than salmon, brown trout, sea trout, rainbow trout and char (see also COARSE FISH, FRESHWATER FISH and SALMONIDS).

FWL

Freshwater Limit.

HECTARE

Unit of area 100m x 100m, equal to 2.471 acres.

IMPOUNDMENT RESERVOIR

Surface water storage area formed by construction of a dam and supplied only by natural inflow from the upstream catchment.

LIST 1 SUBSTANCES

Dangerous substances which are particularly hazardous on account of their toxicity, bioaccumulation potential and persistence and which require special controls. Environmental quality standards are shortly to be introduced into UK law by regulations.

LIST 2 SUBSTANCES

Dangerous substances which are less hazardous than List 1 substances. Environmental quality standards are shortly to be introduced into UK law by regulations.

LOCAL NATURE RESERVE

A nature reserve designated by a Local Authority, frequently owned or managed by a voluntary conservation organisation.

LOCAL PLANS

Statutory documents produced by Borough or City Councils to implement the development strategy set out in County Structure Plans. Specific land use allocations are identified.

LTA

Long term average.

MAIN RIVER

The Agency has permissive powers to carry out works of maintenance and improvement on these rivers.

NATIONAL NATURE RESERVE

A nature reserve of national importance, designated and managed by English Nature.

POTABLE WATER SUPPLY

Water supplied for domestic use, including human consumption.

POOL: RIFFLE

A stretch of river with sections of shallow, fast-flowing water and deeper slow-moving pools.

RAMSAR SITE

A wetland site of international significance for conservation, notified under international treaty.

REDD

Spawning area.

SAC

Special Area of Conservation. A European legislation classification.

SALMONIDS

Fish classified by the Salmon and Freshwater Fisheries Act 1975 as belonging to the Salmon family – salmon, brown trout and char.
(Summer-spawning salmonid species such as grayling are classified by the Act as Freshwater Fish).
(See also COARSE FISH, FRESHWATER FISH and CYPRINIDS).

SNCI

Site of Nature Conservation Interest. A site of local importance for wildlife or geology, identified by the County Wildlife Trust or the County Council.

SPA

Special Protection Area. A European legislation classification.

SPATE FLOWS

Episodic freshwater flood flows.

SSSI

Site of Special Scientific Interest. A site designated by English Nature as being in need of protection to conserve its outstanding ecological features. Land use management operations within SSSIs are subject to control.

Sustainable Urban Drainage Systems (SUDS)

A system which involves mimicking the natural drainage from a site as much as possible to minimise the impact of the development on the water environment.

SWID

Surface Water Interceptor Diverter. A structure added to a separate drainage system that diverts polluted surface water to the foul sewer – used to good effect at the Skelmersdale Industrial Estate.

WwTW

Wastewater Treatment Works.

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Penrith 40 Business Park
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Appleton House
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Fax: 01925 852 260

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

ENVIRONMENT AGENCY GENERAL ENQUIRY LINE
0645 333 111

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

ENVIRONMENT AGENCY EMERGENCY HOTLINE
0800 80 70 60

ENVIRONMENT AGENCY

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