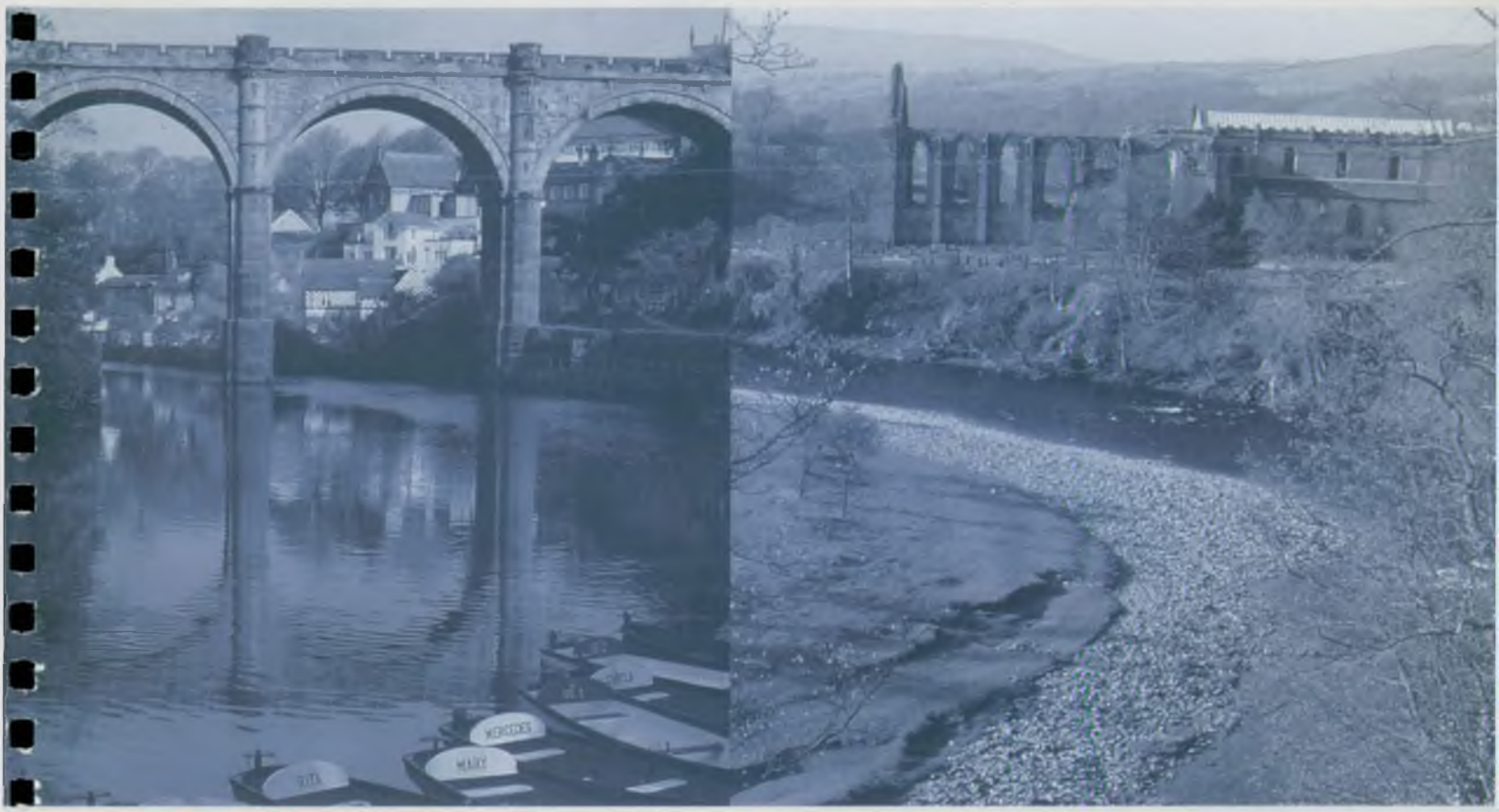
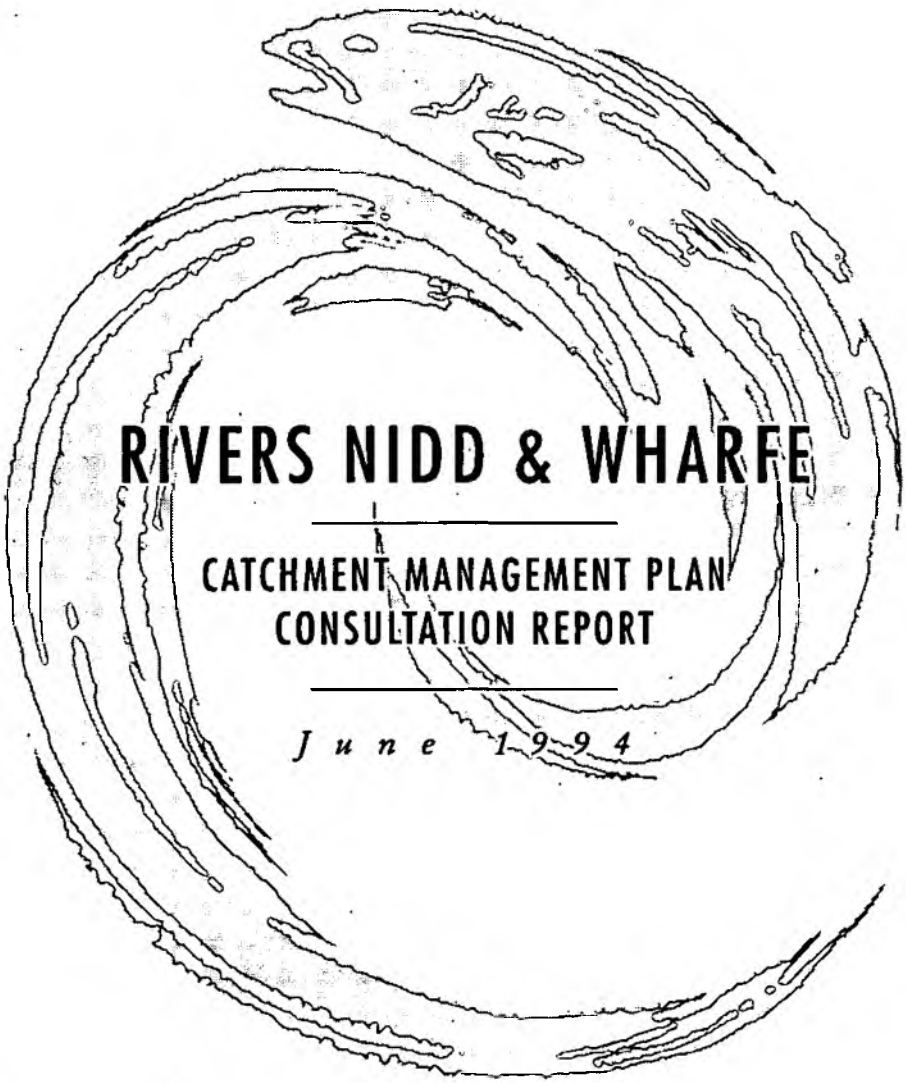
RIVERS NIDD AND WHARFE CATCHMENT MANAGEMENT PLAN CONSULTATION REPORT



NRA

National Rivers Authority
Northumbria & Yorkshire Region
June 1994



RIVERS NIDD & WHARFE

CATCHMENT MANAGEMENT PLAN CONSULTATION REPORT

June 1994

FOREWORD

The National Rivers Authority was established in 1989 as 'Guardians Of The Water Environment'. We have a commitment to safeguard and improve the water environment and to protect people and property from flooding. An essential component of that commitment is a sound and efficient planning base for management and development of river catchments.

Catchment Management Planning aims to provide a means for setting priorities, solving problems and improving and protecting the water environment in a co-ordinated way. The Nidd and Wharfe Catchment Management Plan is being drawn up through consultation with organisations with an interest in the future of these rivers. It provides a focus for all parties to undertake and achieve improvements within the catchment.

This, and subsequent plans for other rivers, in the Region will represent a shared vision for the future and play a vital role in the protection of our water heritage whilst recognising the ever competing pressures on the river environment.

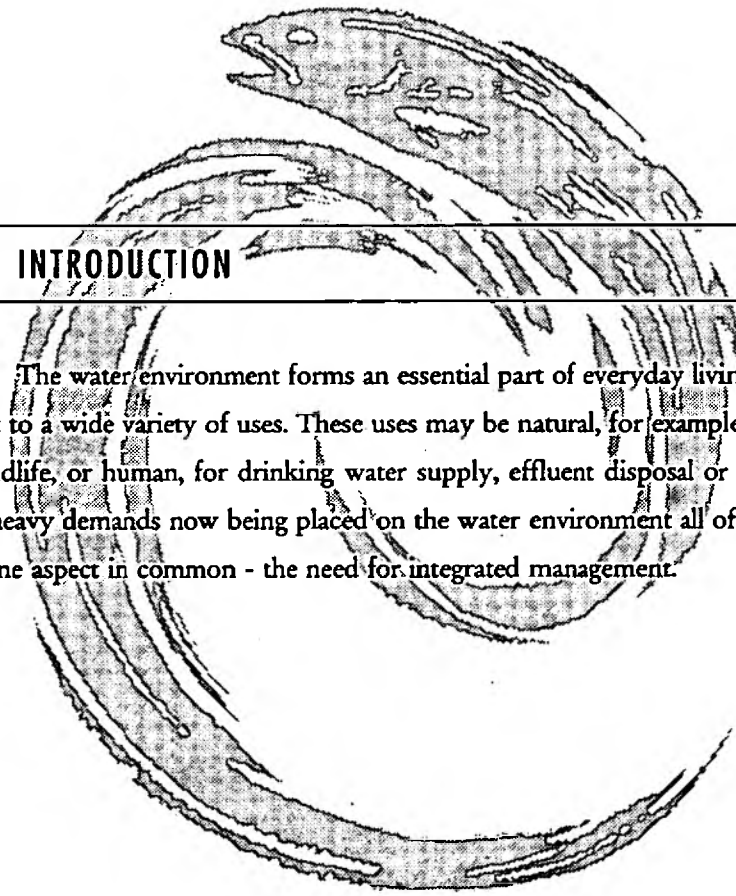
Roger Hyde

Regional General Manager

NRA Northumbria and Yorkshire Region

CONTENTS

LIST OF MAPS



1.0 INTRODUCTION

The water environment forms an essential part of everyday living which is subject to a wide variety of uses. These uses may be natural, for example as habitat for wildlife, or human, for drinking water supply, effluent disposal or recreation. With heavy demands now being placed on the water environment all of these uses have one aspect in common - the need for integrated management.

1.1 THE ROLE OF THE NATIONAL RIVERS AUTHORITY

The National Rivers Authority (NRA) was established on 1 September 1989 as a result of the 1989 Water Act. It was created as a public body responsible for safeguarding and improving the water environment in England and Wales. It is a non-departmental public body, reporting directly to the Department of the Environment (DoE) and working alongside Her Majesty's Inspectorate of Pollution (HMIP) and the Ministry of Agriculture, Fisheries and Food (MAFF).

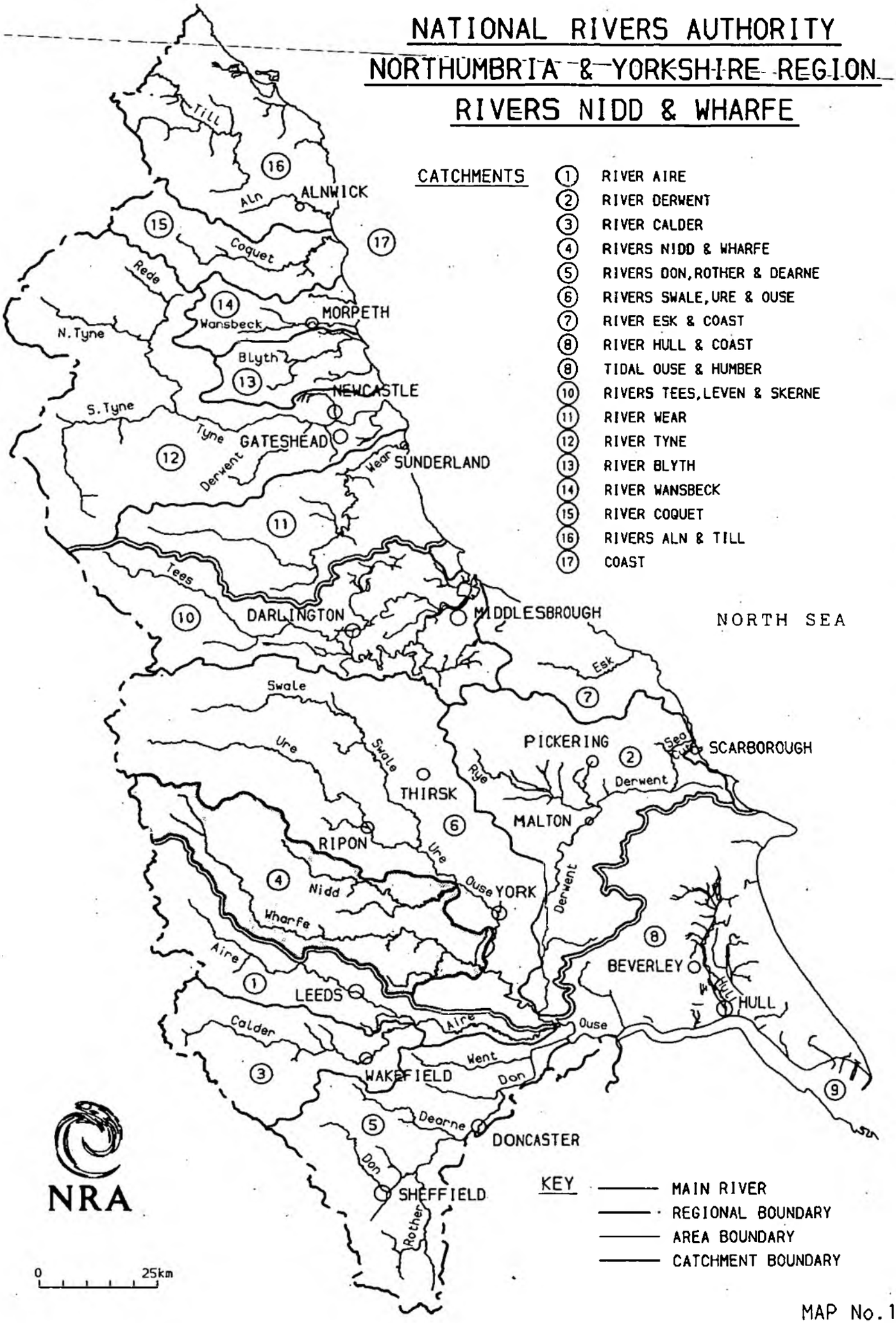
Mission Statement

The National Rivers Authority will protect and improve the water environment. This will be achieved by effective management of water resources and by substantial reductions in pollution. The NRA aims to provide effective defence for people and property against flooding from rivers and the sea. In discharging its duties it will operate openly and balance the interests of all who benefit from and use rivers, groundwaters, estuaries, and coastal waters. The NRA will be businesslike, efficient and caring towards its employees.

The aims of the National Rivers Authority are to:

- achieve a continuing improvement in the quality of rivers, estuaries and coastal waters through the control of water pollution;
- ensure that dischargers pay the costs of the consequences of their discharges, and, as far as possible, recover the costs of water environment improvements from those who benefit;
- assess, manage, plan and conserve water resources and maintain and improve the quality of water for all those who use it;
- provide effective defence for people and property against flooding from rivers and the sea;
- provide adequate arrangements for flood forecasting and warning;
- maintain, improve and develop fisheries;
- develop the amenity and recreational potential of water and lands under NRA control;
- conserve and enhance wildlife, landscape and archaeological features associated with waters under NRA control;
- improve and maintain inland waterways and their facilities for use by the public where the NRA is the navigation authority;
- influence planning authorities to control development so as to avoid conflict with NRA objectives;
- improve public understanding of the environment and the NRA's work.

NATIONAL RIVERS AUTHORITY
NORTHUMBRIA & YORKSHIRE REGION
RIVERS NIDD & WHARFE



MAP No. 1

REGION

The aims of the NRA cannot be achieved solely by the use of its statutory powers but also require effective liaison with local government, industry, conservation groups, the farming community, land owners and the general public.

Catchment Management Planning provides a framework for this liaison.

1.2 WHAT IS CATCHMENT MANAGEMENT PLANNING?

Catchment Management Planning is the process by which issues and opportunities resulting from water-related catchment uses are assessed and actions proposed to optimise the overall, future well-being of the water environment.

The purpose of a Catchment Management Plan (CMP) is to define a strategy for realising the environmental potential of the catchment within the prevailing economic and political constraints.

This is achieved by:

- focusing attention on the water environment of a specific river catchment;
- involving all interested parties in planning for the future of the catchment; and
- establishing an integrated plan of action for managing the catchment over the next five years.

The NRA seeks active input to their Catchment Management Planning from individuals or organisations concerned with the aquatic environment. The Authority would further wish to see the document used to influence and/or assist in the planning processes of others where their decisions may impact on the management of the river.

The process of Catchment Management Planning involves several stages, as outlined below:-

The Consultation Document

The Nidd and Wharfe Catchment Management Plan will form one of several plans to be produced by the Northumbria and Yorkshire Region of the NRA (see map 1).

The publication of this consultation report marks the start of a three month period of formal consultation enabling external organisations and the general public to work with the NRA in planning the future of the water environment of the Nidd and Wharfe Catchment.

It describes the catchment, reviews the state of the water environment and identifies the uses and issues which need to be addressed.

In commenting on the consultation document the NRA would like parties to:

- confirm the range and extent of the catchment resources, uses and activities;
- express views on the issues facing the water environment;
- suggest how the development of strategies and action plans should be progressed;
- identify any actions or strategies of other bodies or organisations for inclusion in the Catchment Management Plan.

The Final Plan

The final Catchment Management Plan will include:

- a vision for the catchment;
- a policy framework based on identified issues for the management of the catchment over a five year period;
- costed action plans to address identified issues.

These elements will only be prepared once the period of consultation on this document has been completed and full consideration has been given to the responses received.

The NRA will monitor the implementation of the plan through regular consultations both internally and with committed parties. Although these plans are non-statutory their aim is to provide a framework for the integrated management of the catchment between the NRA and other bodies.

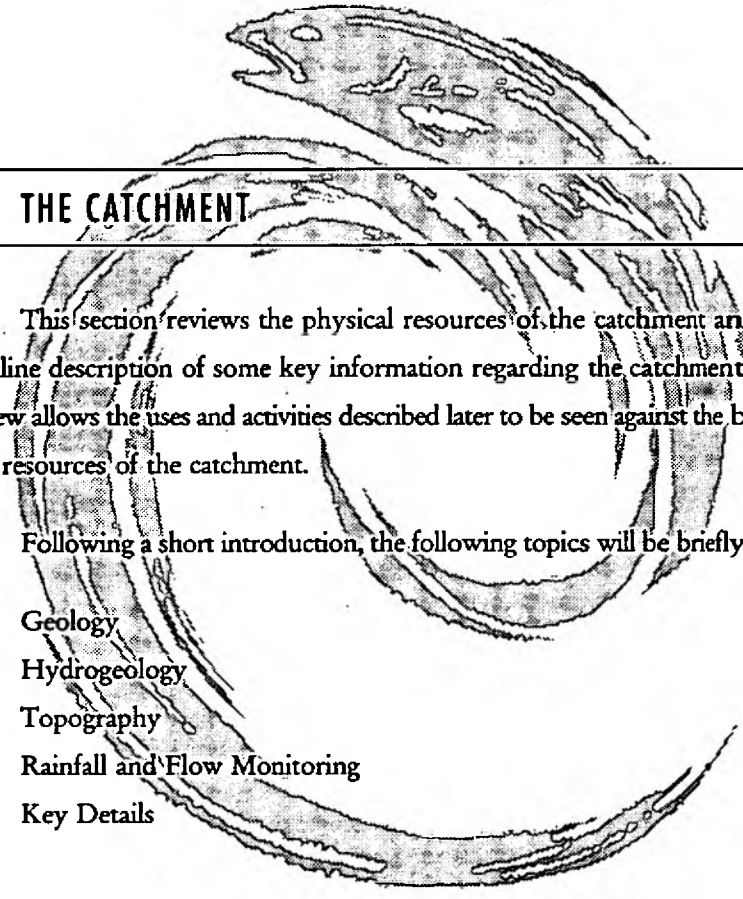
Each plan will be reviewed internally on an annual basis, with a full revision on a five yearly basis.

During the consultation period for this report the NRA would be pleased to receive any comments in writing to:

The Catchment Management Officer
NRA Northumbria and Yorkshire Region
Coverdale House
Aviator Court
Clifton Moor
York
Y03 4UZ

All comments must be received by 30 September 1994.

NOTE: Whilst every effort has been made to ensure the accuracy of information in this Report it may contain some errors or omissions which we will be pleased to correct.



2.0 THE CATCHMENT

This section reviews the physical resources of the catchment and provides an outline description of some key information regarding the catchment area. This overview allows the uses and activities described later to be seen against the background of the resources of the catchment.

Following a short introduction, the following topics will be briefly described:

Geology
Hydrogeology
Topography
Rainfall and Flow Monitoring
Key Details

2.1 INTRODUCTION

The River Nidd rises at Nidd Head near Great Whernside at the edge of the Yorkshire Dales National Park. It is joined by Darley Beck to the south of Summerbridge, Oak Beck just north of Harrogate and the River Crimple at Walshford. The river then meanders eastwards to join the River Ouse at Nun Monkton approximately 7 miles upstream of York (see map 2).

The River Wharfe rises in the Northern Pennines close to Ribblehead, and is formed at the confluence of Oughtershaw and Langstrothdale becks at Beckermonds. Soon the river is joined by the River Skirfare and then flows in a narrow valley past small villages and the town of Grassington. Having passed the A59 at Bolton Bridge, the river flows east through the conurbations of Ilkley, Otley, Wetherby and Tadcaster. The river, which at this point is tidal, then flows past Ulleskelf before entering the River Ouse to the east of Ryther.

2.2 GEOLOGY

The characteristic limestone scenery of the Dales in Upper Wharfedale and Littondale is produced by the Carboniferous Limestone, which comprises a sequence of limestones and shales (see map 3). The rocks become progressively more recent in age moving down river from the Dales. The Nidd rises on Carboniferous Millstone Grit, the underlying Carboniferous Limestone appearing in only a few isolated places such as the well known feature Howstean Gorge. The River Nidd goes underground for a length above Lofthouse. The Carboniferous Millstone Grit, sandstones and shales form an area of grit moorland in the catchments of the Rivers Washburn, Dibb, Barden Beck and other tributaries of the Wharfe.

The Permo-Triassic rocks of the Vale of York cut across the Carboniferous rocks. The Magnesian Limestones (limestones and thick clays) form a north-south ridge of higher land on the western side of the Vale of York, followed for much of its length by the A1. These outcrop as limestone cliffs alongside the Nidd in Knaresborough. As the Magnesian Limestones dip gently eastward they are overlain by the Sherwood Sandstone Group, a thick soft sandstone that forms the centre of the Vale of York.

RIVERS NIDD AND WHARFE CATCHMENT

THE CATCHMENT

0 2 4 6 8 10km

SCALE

NRA

National Rivers Authority
Northumbria & Yorkshire Region

MAP No 2

RIVERS NIDD AND WHARFE CATCHMENT

GEOLOGY

NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No 3

2.3 HYDROGEOLOGY

Within the Carboniferous rocks, in the Dales, the limestones and sandstones form minor aquifers, giving rise to springs and sinks where the rocks outcrop.

Springs are important sources of public water supply in the Dales, though they are vulnerable to contamination particularly after heavy rain. Few boreholes exist in Carboniferous rocks, and yields are generally low. The eastern end of the Greenhow mining area is drained by the Eagle Level adit which is used for public supply in the Pateley Bridge area. The Yorkshire Water Nidd aqueduct from Scar House Reservoir is tunnelled through the western end of the mining area and intercepts groundwater along its route.

Major aquifers exist in the Magnesian Limestone and the Sherwood Sandstone. The Breweries (together with many other abstracters) abstract large volumes of water from the Magnesian Limestone which outcrops in the Tadcaster area. A number of public water supply boreholes exist in the Sherwood Sandstone with many private abstractions for farm supplies and spray irrigation. A few industrial boreholes are utilised in York and Selby. Borehole yields from the Sherwood Sandstone may be up to 6 Thousand Cubic Metres per Day (TCMD). Water quality is generally good, though sometimes hard, and there may be high levels of iron, manganese or nitrate in certain areas. Water in the Magnesian Limestones may become very hard where the aquifer is confined by marls (clays), because of the presence of gypsum.

An extensive network of groundwater monitoring is undertaken by the NRA in the major aquifers, especially in the Sherwood Sandstones.

Groundwater hydrographs for a number of sites in the Magnesian Limestone/Sherwood Sandstone, that have been unaffected by groundwater abstraction, reflect the weather pattern over the last 25 years with maximum levels in 1969 and 1980, and minimum levels in 1976 and 1992.

2.4 TOPOGRAPHY

The Rivers Nidd and Wharfe rise in The Dales surrounded by hills that are often above 600m Above Ordnance Datum (AOD). Great Whernside, the highest point in the catchment at the head of the Nidd is 704m AOD with Pen y Ghent (694m AOD) lying between Wharfedale and Ribblesdale.

Nidderdale and Wharfedale run south eastwards towards the Vale of York, through hills that gradually decrease in height, and they eventually turn eastwards to flow through the more subdued topography of the margins of the Pennines. The rivers then cut through the ridge of higher land formed by the outcrop of the Magnesian Limestone before entering the Vale of York. The Vale of York forms a low lying area running north-south, between the Pennines on the west, the North Yorkshire Moors in the north and the Wolds on the east, through which all the Yorkshire Pennine rivers flow.

2.5 RAINFALL AND FLOW MONITORING

The NRA manages a regional rainfall monitoring network which consists of 28 rain gauges in the Nidd and Wharfe catchment. Of these rain gauges, 3 are incorporated into the Regional Telemetry System (RTS) and enable up-to-the-minute information to be gathered by computers and displayed at an NRA office (see map 4). This information is used to predict likely flood situations. As well as providing details of extreme events, the gauges also enable the variations in long term average rainfall to be examined.

Being such a large and topographically varied catchment, the annual rainfall varies dramatically, ranging from 600 mm at Cawood to 2000mm at the top of the Wharfe. With the top of the catchment having so much rain, there is effective rainfall all year long but the Vale of York has no effective rainfall during an average summer.

The high rainfall in the Dales and long, narrow catchment of Nidderdale and Wharfedale cause the rivers to rise quickly in response to rainfall though the Nidd is extensively reservoired and shows a more limited response.

Annual Potential Evapotranspiration ranges from 500mm at the top of the catchment to 560mm in the Vale of York. This compares with the Yorkshire average of 543mm. In the wet higher parts of the catchment, actual evapotranspiration only just falls below potential evapotranspiration during an average summer but in the drier Vale of York the actual evapotranspiration drops well below potential evapotranspiration from early to late summer.

In addition to the rainfall gauges there is a network of river gauging stations, which provide information on river flows and levels throughout the catchment. There are also a number of water level only monitoring stations. The data from these stations are used to produce flow statistics both on a long term and annual timescale. Twelve of the stations are incorporated into the Regional Telemetry System (RTS) and are used to gather and collate up-to-the-minute information during periods of high flow which in turn is used to forecast levels at flood prone sites.

RIVERS NIDD AND WHARFE CATCHMENT

RIVER AND RAINFALL GAUGING STATION

1. MALHAM TARN ●
2. KETTLEWELL ●
3. GRASSINGTON ●
4. HEBDEN
5. GRIMWITH
6. SCAR HOUSE ●
7. ADDINGHAM ●
8. GOUTHWAITE ●
9. OTLEY
10. BIRSTWITH ●
11. SCARGILL ●
12. ARTHINGTON ●
13. BURNBRIDGE
14. BLACKSTONES FARM
15. FLINT MILL
16. HUNSINGORE ●
17. COWTHORPE ●
18. TADCASTER ●
19. SKIP BRIDGE ●
20. COCK BECK SLUICES ●
21. FLEET ●

● Incorporated into Regional Telemetry System

NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No.4

2.6 KEY DETAILS

Area: 1,555 km²

Geology: Nidd: Millstone Grit, Magnesian Limestone, Sherwood Sandstone Group;

Wharfe: Carboniferous Limestone, Millstone Grit, Magnesian Limestone, Sherwood Sandstone Group.

ADMINISTRATIVE DETAILS

County Councils: North Yorkshire (NYCC)

District Councils:

	% area
Bradford	3
Craven	26
Harrogate	48
Leeds	14
Selby	9

Water Companies: Yorkshire Water Services (YWS) Ltd

National Parks: Yorkshire Dales National Park

Navigation Authorities: None

Internal Drainage Boards: Acaster
Appleton Roebuck & Copmanthorpe
Claro
Marston Moor
North Wharfe
South Wharfe

Main Towns and Populations 1981 Census data

Burley Menston	11672
Harrogate	63637
Ilkley	13060
Knaresborough	13848
Otley	14470
Pateley Bridge	2540
Tadcaster	5877
Wetherby	18359

WATER QUALITY

Length of Classified River in National Water Council (NWC) Class - 1992 Survey

	NIDD		WHARFE	
	km	%	km	%
Class 1A	172.8	55.52	305.3	66.49
1B	90.8	29.18	150.6	32.80
2	35.9	11.54	3.3	0.71
3	11.7	3.76	0	0
4	0	0	0	0

FLOOD PROTECTION

Length of Designated Main River:	255 km
Length of raised Flood Defences on Main River (both banks):	52 km
Number of people and property protected:	2800 House Equivalents

ABSTRACTION LICENCES AND DISCHARGE CONSENTS (1992)

Total Number of Licensed River Abstractions	266
Total Number of Licensed Groundwater Abstractions	283
Total Number of Consented Trade & Sewage Discharges	1273
Total Number of Consented STW's > 250 p.e.	27

CONSERVATION

	NIDD	WHARFE
Number of AONB's	1	1
Number of SSSI's	8	40
Number of NNR's	1 (proposed)	1
Number of Ramsar Sites	0	0
Number of SPA's	0	0
Local Nature Reserves	1	1

WATER RESOURCES

Reservoir	Capacity ($10^3 m^3$)
Angram	4548
Scarhouse	9918
Gouthwaite	5873
Haverah Park Group	1488
Grimwith	21764
Barden, Upper and Lower	4228
Chelker	949
March Ghyll	385
Thruscross	7842
Fewston	3846
Swinsty	3937
Lindley Wood	3045
Rombalds Moor Group	123

3.0 STATE OF THE CATCHMENT

The purpose of this section is to compare the known current state of the catchment with overall standards/targets (where they are available) in respect of three areas:

water quality (evaluated in terms of chemical and biological criteria);
water quantity; and
physical features such as flood defence

For each area information is provided under the following headings:-

Background

Targets

- Current targets , standards or long term objectives
- Legislation influencing the target

Current Status

- The current state highlighting areas of failure to reach target, objective or standard.

3.1 WATER QUALITY - *Chemical*

Background

Rivers and tributaries in the Nidd and Wharfe catchment are of generally high quality, suitable for potable supply and capable of supporting trout or high class coarse fisheries. A comprehensive water quality monitoring programme enables the NRA to assess whether or not the rivers meet their required standards.

Targets

Water quality is assessed against the following measures :

- National Water Council (NWC) classes;
- Compliance with River Quality Objectives (RQO's);
- Statutory Water Quality Objectives (SWQO's);
- Compliance with EC Directives;
- North Sea Reduction Programme;
- Biological Classes.

National Water Council Classification and River Quality Objectives

The NRA currently uses a system of River Quality Objectives (RQO's) for the classification and assessment of watercourses including canals. This system is derived from the 1978 National Water Council Policy Document.

The NWC classes are based upon a limited range of criteria; Biochemical Oxygen Demand (BOD), Dissolved Oxygen (DO) and Ammonia. The classes are ranked in order; 1A, 1B, 2, 3 and 4, with 1A being the highest quality.

River Quality Objectives are based upon water quality requirements for different uses of the river including potable and industrial water supply, the type of fishery, spray irrigation, livestock watering and level of amenity.

Statutory Water Quality Objectives

Under the Water Resources Act 1991, a framework for managing the quality of rivers, estuaries, coastal waters, lakes and groundwaters is to be introduced, known as Statutory Water Quality Objectives. Although similar to the existing system, this will be a new classification of quality which will be more closely related to the water uses.

European Commission (EC) Directives

The introduction of European Commission (EC) Directives from 1976 to protect the water environment has had a significant impact on water quality issues. The United Kingdom (UK) has adopted the appropriate directive requirements and is incorporating them into UK legislation to complement other NRA water quality improvement measures and monitoring schemes.

Annual reports are made by NRA to the Department of the Environment (DoE) for fresh and saline waters using results from a comprehensive sampling and analysis programme. Quality assessments are made using specific numerical standards which are currently the only statutory water quality requirements. Where waters do not comply with the standards, the NRA is required to develop improvement plans to ensure the situation is remedied within an identified timescale.

The following Directives apply or will apply to the Nidd and Wharfe catchment:

The Surface Water Abstraction Directive (75/440/EEC)

The Directive ensures that water abstracted from rivers or reservoirs for drinking water purposes achieves set standards prior to treatment and distribution to public supply. Formal arrangements are in place between the water companies and NRA to address non compliances and other issues.

Due to the importance of the Nidd and Wharfe catchment as a source of drinking water considerable emphasis is placed on the monitoring of pesticides concentrations within the catchment. Sporadic exceedance of the 0.1 ug/l limit for certain herbicides has been reported by the water companies and confirmed by NRA routine monitoring. However, as this low level contamination is most likely to arise from diffuse inputs, direct control by the NRA is not possible.

Dangerous Substances Directive (76/464/EEC)

The Directive sets numerical standards for identified substances, which are particularly harmful to the water environment and these must be achieved in all waters. New substances are introduced by the EC at intervals as new environmental initiatives are taken.

Compliance with the Dangerous Substances Directive is assessed by monitoring for specific substances downstream of registered discharges, and at a reference site in the lower reaches of the catchment.

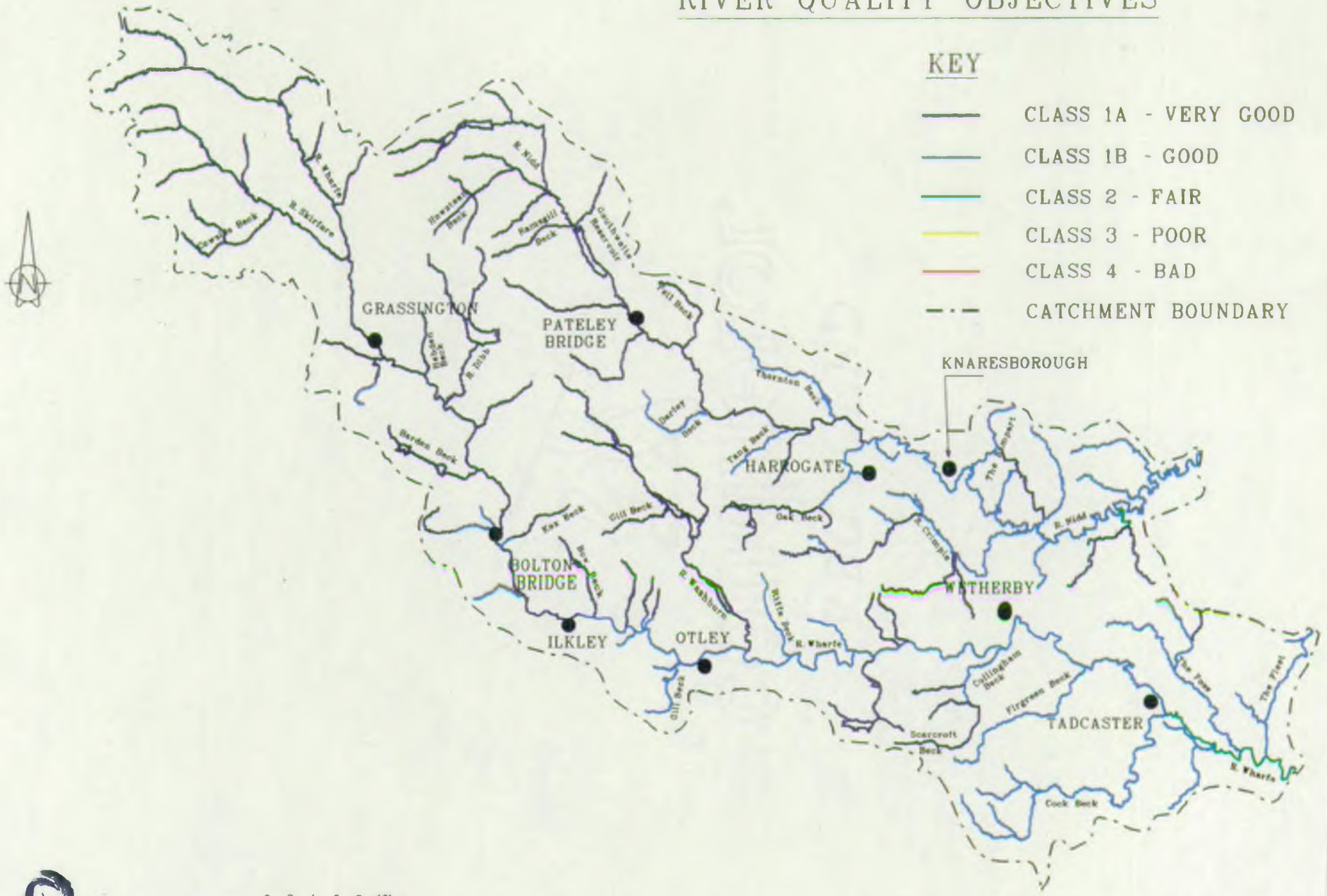
There were no monitored exceedances for List I dangerous substances within the catchment during 1992.

The Freshwater Fisheries Directive (78/659/EEC)

The Freshwater Fisheries Directive requires that where rivers are designated and suitable for salmonid or cyprinid fish populations, then the Directive water quality standards must apply.

RIVERS NIDD AND WHARFE CATCHMENT

RIVER QUALITY OBJECTIVES

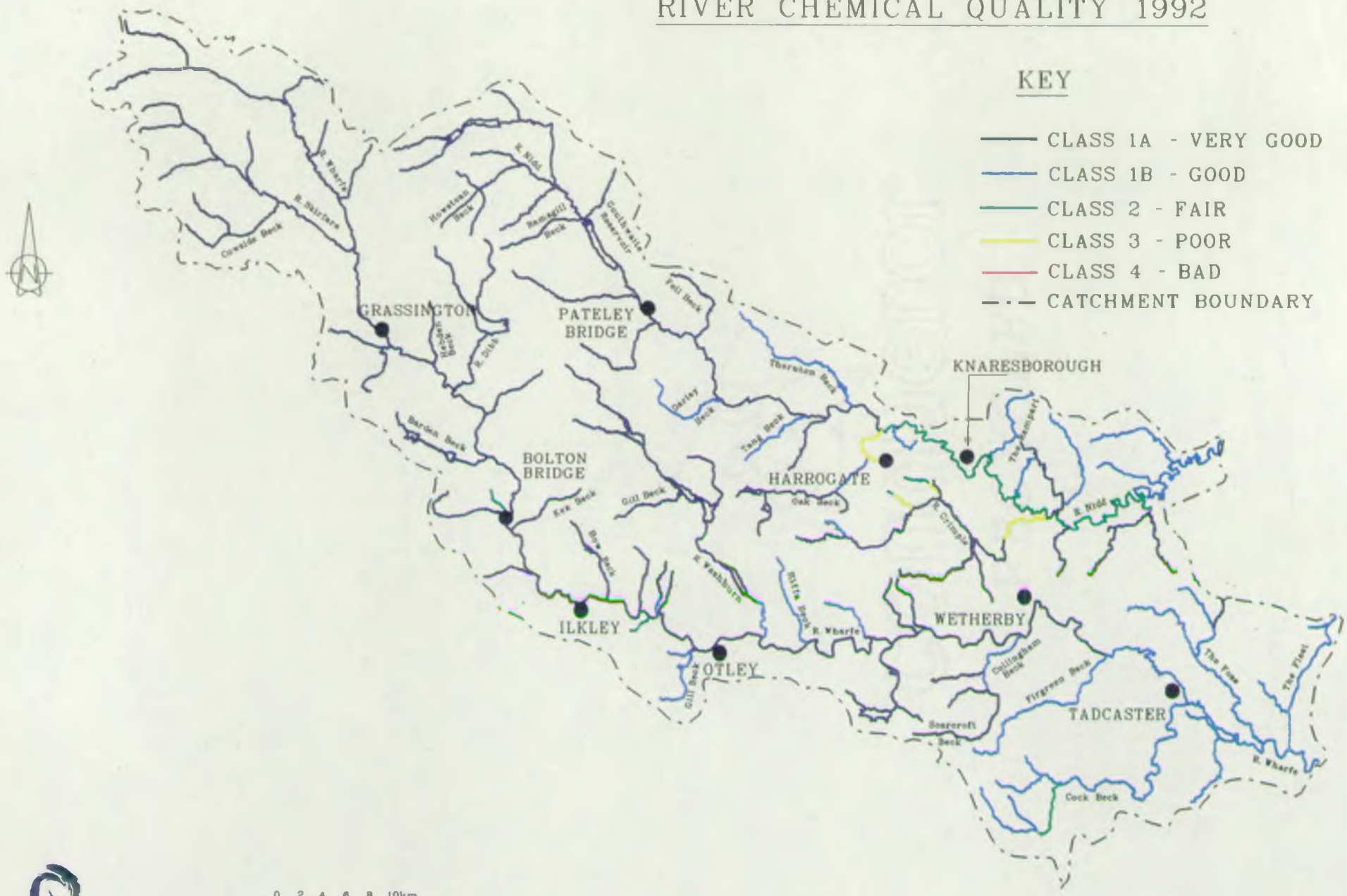


NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No 5

RIVERS NIDD AND WHARFE CATCHMENT

RIVER CHEMICAL QUALITY 1992



NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No.6

New designations may be made by notifying the DoE and permanent deterioration of designated waters is not permitted.

The Urban Waste Water Treatment Directive (91/271/EEC)

The Directive will apply to discharges of domestic sewage and similar industrial discharges made to fresh and saline waters and will be implemented in the period up to 2005. Standards will be set for discharge quality with levels of treatment being specified according to the receiving water quality and characteristics.

North Sea Reduction Programme

Since 1987, the UK has adopted national and international initiatives to reduce pollution to the North Sea. The Paris Commission programme and the UK Red List substance initiative have estimated pollutant loads from rivers and discharges as a first step towards the identification of improvement measures.

Progress has been made with load reductions by the issue of consent conditions for appropriate discharges to achieve a 50-70% reduction over the period 1985-1995.

Current Status

River Quality Objectives were set for the rivers in the catchment in the late 1970's. These Objectives and the 1992 Chemical Quality for the catchment are shown on maps 5 and 6.

WATER QUALITY - *Biological*

Background

Biological criteria are an important component of water quality monitoring as they provide an assessment of the impact of discharges on the aquatic environment. Biological classifications are based on the presence and abundance of macroinvertebrate animals. The status of invertebrate communities can be used to monitor the overall long term health of the river.

Targets

Biological water quality can be expressed in various ways, but the most convenient method is one which parallels the chemical water quality classification, which has classes ranked 1A, 1B, 2, 3 and 4, termed the Yorkshire Interpretive Index. The biology classes are prefixed with B and indicate 'very good', 'good', 'fair', 'poor' and 'bad' quality. These classes are derived from the interpretation of the types and numbers of the freshwater invertebrate animals present, and knowledge of their tolerance or sensitivity to pollution. A nationally agreed method linked to the proposed SWQO system will probably be introduced in the near future.

Current Status

Very good biological water quality prevails in the upper Nidd catchment, both in the main river and its tributaries. Some of the tributaries support faunal assemblages indicative of intermittent acidic conditions, for example Backstean Gill and Armathwaite Gill.

The majority of the lower reaches of the Nidd achieve only fair quality, with many of the tributaries being of fair or poor quality. Sewage final effluents, storm sewage overflows and farm discharges appear to be the main causes of water quality problems in this part of the catchment.

Such issues are being investigated jointly by biology and environmental protection staff and measures are being taken, where possible, to effect improvements in water quality.

The biological water quality of the whole Wharfe catchment is predominantly very good or good, (above the tidal limit) as well as the majority of tributaries in the upper catchment. Low flows result in restricted faunal populations in some tributaries, eg Skirfare, and the upper reach of the River Washburn supports a faunal assemblage indicative of acid conditions.

A number of tributaries in the lower Wharfe catchment, along with Town Beck, Mickle Ing Beck and Gill Beck in the upper catchment, have only fair biological quality and a very small number suffer from poor quality. Deteriorations in quality are largely associated with sewage discharges and agricultural activities.

The biological quality of the River Wharfe below Ulleskelf is affected by tidal influences and could not be readily classified using the Yorkshire Interpretive Index. However, both sites sampled supported reasonably diverse fauna indicative of fair to good biological quality.

The 1991/92 biological water quality for the Wharfe catchment is shown on map 7, along with 1993 classifications for the Nidd catchment.

General Statistics:

		RIVER NIDD		RIVER WHARFE	
Water Quality	Class	No. sites	% of total	No. sites	% of total
Very Good	B1A	20	32	30	43
Good	B1B	10	16	22	31
Fair	B2	21	34	13	19
Poor	B3	10	16	3	4
Bad	B4	0	0	0	0
	N/C	1	2	2	3
Total		62	100	70	100

RIVERS NIDD AND WHARFE CATCHMENT

BIOLOGICAL WATER QUALITY 1992/93

KEY

- CLASS B1A - VERY GOOD
- CLASS B1B - GOOD
- CLASS B2 - FAIR
- CLASS B3 - POOR
- CLASS B4 - BAD
- UNCLASSIFIED
- TIDAL
- CATCHMENT BOUNDARY

0 2 4 6 8 10km

SCALE

NRA

National Rivers Authority
Northumbria & Yorkshire Region

MAP No 7

3.2 WATER RESOURCES

Background

Groundwater and surface water together combine to make up the water resource of the catchment. This resource may often have potential for development as a source of potable water or for other uses. However, the resources must also be protected in terms of quality and quantity by achieving a balance between the rights of abstractors, other lawful users of the waters and the needs of the environment.

Targets

The NRA has a duty under the Water Resources Act 1991 to conserve, redistribute, augment and ensure the proper use of water resources whilst at the same time conserving and enhancing the environment.

In order to achieve this, the NRA will continue to ensure effective management of the resource by the development and implementation of Regional Water Resources strategies and the implementation of Licensing Policy.

The Authority proposes to review its existing policies for the determination of groundwater and surface water abstraction licences. The revised methodologies will aim to ensure that applications are determined in a consistent and even-handed manner and that due regard is given to the needs of the environment as well as the rights of existing lawful users.

The NRA also seeks to ensure the protection of groundwater resources, the delineation of ground water protection zones and the implementation of these in conjunction with the NRA's "Policy and Practice for the Protection of Groundwater".

Current Status

A report entitled "Water Resources Development Options for Yorkshire" has been prepared by consultants. This report formed the initial stage in the development of a Regional Water Resources Strategy. This Strategy, due to be published in July 1994, will provide the basis for resource management within the Region. The Strategy will then be implemented via the licensing process.

The "Policy and Practice for the Protection of Groundwater" was produced in 1991. It aims to provide a framework for the protection of both individual groundwater sources and groundwater resources as a whole. In order to achieve this, the NRA is currently in the process of delineating Groundwater Source Protection Zones for all groundwater sources licensed to abstract more than 1 TCMD.

Consultants have been engaged to review the existing policies for the determination of surface water abstraction licences. The fourteen month project will comprise the review of existing methodology and proposals for a revised process for determination of surface water abstraction licences.

A similar process will start for groundwater abstraction licences within the next two years.

The Nidd and Wharfe are high class clean rivers and have been used extensively (together with the Rivers Swale, Ure, Ouse and Derwent) as a source of potable water for urban Yorkshire. There has also been an increased demand for spray irrigation water, often at times when river flows are at their lowest. There are significant issues to be considered with regard to water resources and their environmental impact in the Nidd and Wharfe catchments.

Reservoirs and abstractions of water for public supply affect flows in both the Nidd and Wharfe.

In Nidderdale, Scarhouse and Angram reservoirs were built at the turn of the century to supply water to Bradford. During the same period, Gouthwaite Reservoir was built to maintain flows in the river for the benefit of mill owners and riparian proprietors downstream. No water can be taken from Gouthwaite for public supply. A Board of Management is charged with formulating rules for the release of compensation water from Gouthwaite. The rules governing compensation have been formulated with the aim of satisfying, to different extents and at different times, the following :-

a) Abstraction for industrial purposes.

b) Fishing in the reservoir.

c) Fishing in the River Nidd.

d) Maintenance of the end of the reservoir as an amenity.

e) Reduction of peak flood levels.

f) Maintenance of flows in the Nidd for general benefit.

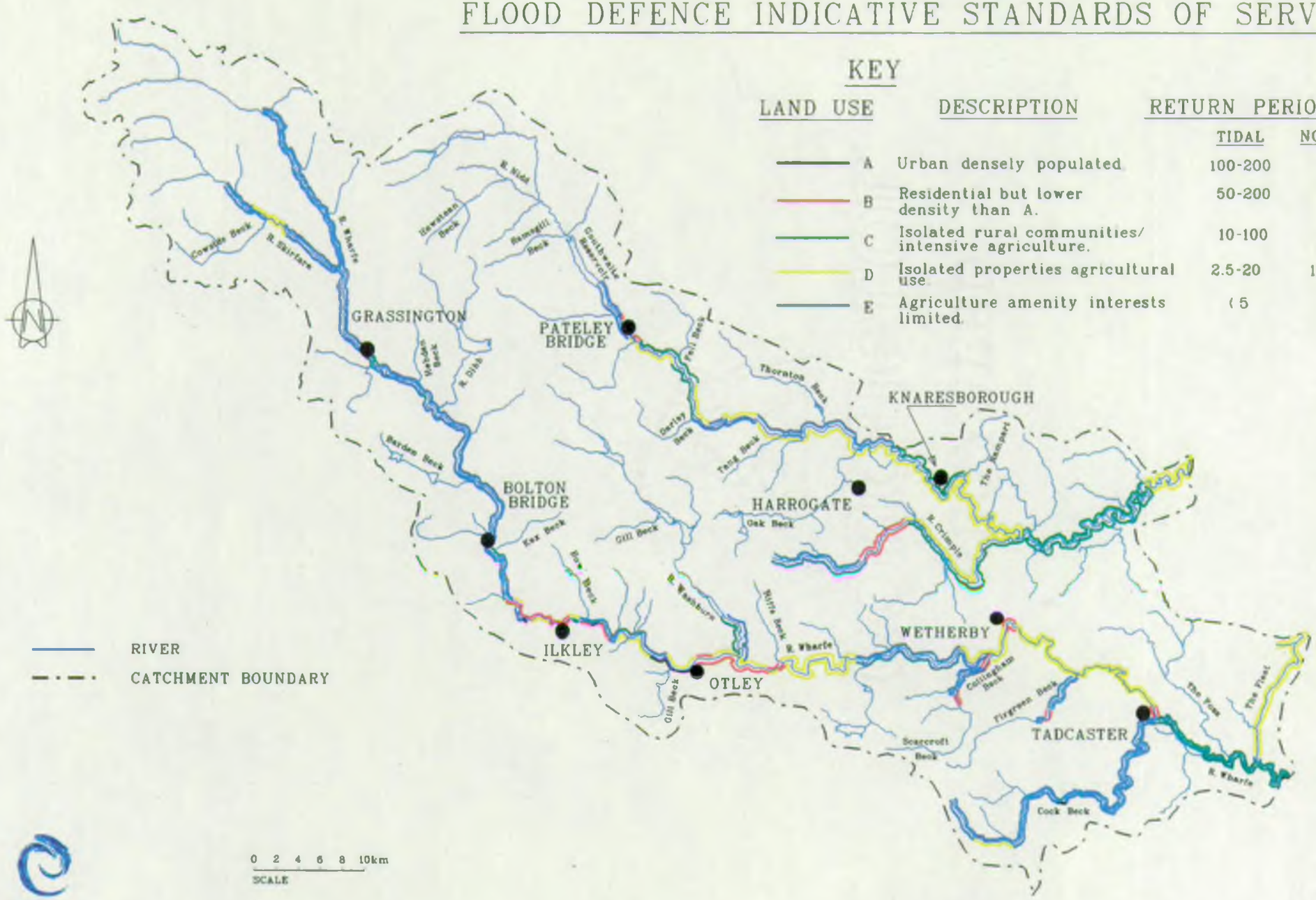
g) The nature reserve at the head of the reservoir.

The above has been achieved by providing flood storage during winter months, filling the reservoir during March and then retaining water in the reservoir during the spring and early summer, in order to release large volumes of water into the river later in the summer. During dry summers, releases from Gouthwaite make up a significant proportion of the flow, helping to dilute effluents discharged downstream and maintain satisfactory oxygen levels in the river.

There are no reservoirs impounding the flow of the River Wharfe itself. However, there are reservoirs on a number of tributaries of the Wharfe, namely the River Dibb, Barden Beck and River Washburn. The Washburn Valley and Barden reservoirs supply water direct to Leeds and Bradford. Water is abstracted for public supply from the Wharfe at Lobwood, The Hollins and Arthington. Grimwith Reservoir on the River Dibb is used to support flows in the Wharfe and the abstraction at Lobwood for potable supply when flows in the river are low.

RIVERS NIDD AND WHARFE CATCHMENT

FLOOD DEFENCE INDICATIVE STANDARDS OF SERVICE



NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No.8

3.3 PHYSICAL FEATURES

FLOOD DEFENCE

Background

Some watercourses are classified by the Ministry of Agriculture Fisheries and Food (MAFF) for flood defence purposes: these classified watercourses are known as 'Main River'. On 'Main River' the NRA has control over some activities on the protected bankside land and can undertake improvement and maintenance works. On non 'Main River' watercourses the NRA only has powers to control activities affecting the flow of watercourses.

Historically development and also the most intensive forms of agriculture have been concentrated in the valleys. Much of the valley floor within these catchments is subject to flooding and the area considered to be at risk from flooding is known as floodplain. Some areas of floodplain are now protected from flooding to a certain level of service e.g. 1 in 20 years but there are still many areas where floodwaters flow or are stored during times of flood; these areas including those which only flood in extreme events are known as washland.

Targets

The NRA aims to provide effective protection for people and property from flooding. This is achieved by the construction and maintenance of flood defences and through the provision of effective and timely warnings.

Flood events are described in terms of the frequency at which, on average, a certain severity of flood is exceeded. This frequency is usually expressed as a return period in years e.g. 1 in 50 years. Different types of land use require different levels of effectiveness from the defences, for example people and property have a higher standard of protection than agricultural land.

The decision as to whether or not flood defences will be provided or improved involves consideration of many aspects including cost effectiveness, environmental acceptability and the wishes of the local population. In order to provide a starting point from which specific investigations can be targeted the current land use of areas at risk from flooding is considered. For each land use band indicative standards of service are allocated. These indicative standards are then compared with the actual level of protection provided.

The five land use bands are given over and the indicative standards of service for the catchment are indicated on map 8.

Land-Use Band	*Description*	*Indicative Standard of Protection (Return Period in years)* Tidal	Non-tidal
A	Contains residential and non residential properties distributed over a significant proportion of its length. Amenity uses may be prominent.	100-200	50-100
B	Reaches containing residential and non-residential property over some or all of the reach length but at a lower density than Band A. Intensive agriculture may be present.	50-200	25-100
C	Isolated rural communities at risk with limited numbers of residential and non-residential properties. Agricultural interests will be more apparent than in Bands A & B.	10-100	5-50
D	Isolated properties at risk. Agricultural use will probably be the main use with arable farming a feature.	2.5-20	1.25-10
E	Very few properties at risk. Agricultural use will predominate with extensive grassland the main feature.	<5	<2.5

The land use band reflects all the interests in the floodplain as well as the riparian owner, and takes account of the wider community by including roads and amenity features such as riverside footpaths and recreation areas.

Current Status

The following is a list of areas currently identified as areas where the indicative standards of service for flood defence are not achieved:

Urban

River Nidd

Pateley Bridge

River Wharfe

Addingham, Ilkley, Otley, Burley, Pool, Collingham, Bramham

Rural

River Nidd

Kirk Hammerton, Tockwith, Nun Monkton

River Wharfe

Kettlewell, Burnstall, Bolton Bridge, Low Mill / High Mill - Addingham, Thorpe Arch

4.0 CATCHMENT USES AND ACTIVITIES

This section is to review the uses made of the catchment and the activities within it which are likely to affect or be affected by the water environment.

For each use information is provided under the following headings :-

GENERAL

How the use or activity affects or is affected by the water environment.

Management Framework

How the use is managed and by whom.

LOCAL PERSPECTIVE

Current Situation

A more local perspective of the uses or activity within the catchment area; information is presented in map form where possible.

Future Situation

The possible future development of that use within the catchment.

4.1 SURFACE WATER ABSTRACTION

GENERAL

Abstraction of water for supply to potable and industrial use affects the water environment by reducing the volume of water downstream of the abstraction. Rivers subject to frequent abstractions are regulated by reservoir or inter catchment transfer to allow a year round sustainable yield. Regulation and the mass transfer of abstraction water along rivers can have a large environmental impact and consequences for many other users.

Management Framework

All abstractions are controlled by licences which stipulate the total hourly, daily flow and annual quantities authorised for abstraction. Conditions may be imposed where appropriate in order to protect downstream abstractions, other users, the quality of the water environment and in-river needs.

LOCAL PERSPECTIVE

Current Situation

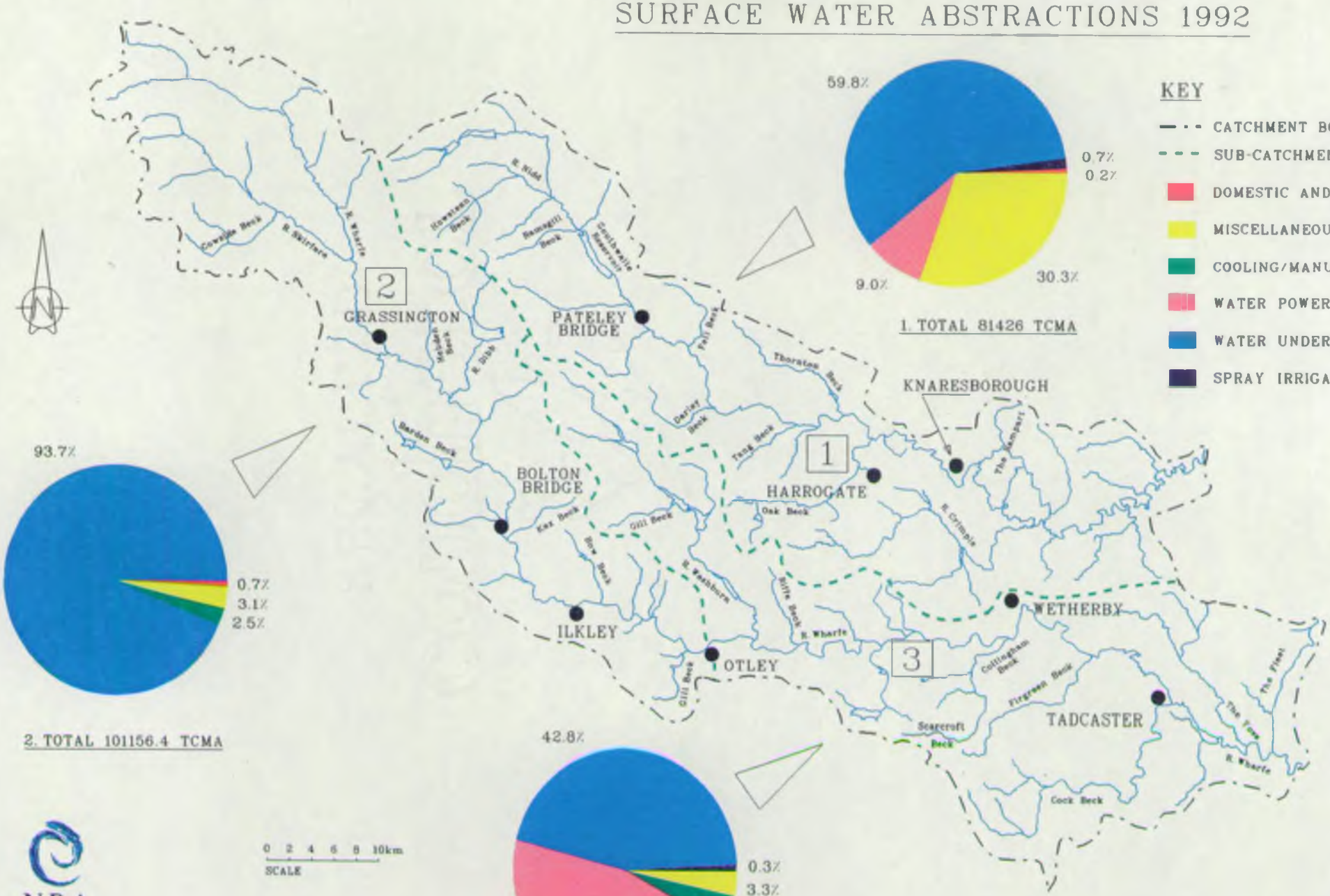
There are a total of 26 impounding reservoirs within the catchment of the Nidd and Wharfe. These are mainly public water supply reservoirs operated by Yorkshire Water Services (YWS) Ltd which fall into 2 groups:

- Reservoirs supplying drinking water to the Leeds/Bradford conurbation and Harrogate.
- Reservoirs which support flow in the rivers or provide augmentation flow for abstractions.

There are also major public water supply abstractions at Lobwood licensed to take 127.25 Ml/d, The Hollins, 34.1 Ml/d maximum subject to river flow conditions and Arthington licensed for 100 Ml/d on the Wharfe. All abstractions are subject to flow condition such that abstraction is only permitted when flow is greater than a prescribed value at Low Mill Gauging Station. The Arthington abstraction is presently for emergency use only, although there are proposals to use this abstraction as part of a pumped storage scheme where water is taken from the Wharfe during winter when flows are high and stored in the Washburn Valley Reservoirs. This has been identified in the Water Resource Development Options for Yorkshire report.

Abstraction for Public Water Supply accounts for nearly half of all water abstraction within the catchment (see map 9). Water power/industrial use/cooling and spray irrigation are the other main uses or surface water each accounting for just over 20% of the total surface water abstraction. The remaining abstraction is for fish farming and domestic and agricultural supplies. Although domestic uses and agricultural abstractions represent only 0.1% of the total volume abstracted they account for over 40% of the total number of abstraction licences.

RIVERS NIDD AND WHARFE CATCHMENT
SURFACE WATER ABSTRACTIONS 1992



MAP No.9

Future Situation

Should the demand for water increase a number of options would be considered to provide for any shortfall. These include improved leakage control, pumped augmentation of the Washburn Valley reservoirs and alterations to the abstraction licence at Lobwood.

Two sites on the Wharfe have been identified as being in the national top 40 for low flow alleviation. Both these sites are associated with paper mills in Otley and Pool-in-Wharfedale. During times of low flow, abstraction by the mill in Otley, upstream of the weir, takes all the river flow thereby stopping flow over the weir. This adversely affects the stretch of main river between the weir and the point at which the water is discharged back into the river.

To alleviate this problem, discussions are held with the licence holder with a view to amending the licence so that a flow over the weir is maintained at all times. At Pool-in-Wharfedale the river splits into two with one channel feeding into a mill race from which water is abstracted. During times of low flow all the flow in the river is diverted down the mill race to supply the paper mill. This means that the natural river channel is badly affected. An agreement is being sought with the licence holder to design a regime whereby a percentage of the river continues to go down the natural channel during low flow periods.

4.2 GROUNDWATER SUPPLY AND PROTECTION

GENERAL

This use of the catchment relates to the abstraction of water from groundwater sources such as wells and boreholes for both potable and industrial supply.

Management Framework

Management of the groundwater resources is achieved through abstraction licences, which specify the quantities of water that may be abstracted. Licences may include conditions which are designed to protect aquifers from over-abstraction.

LOCAL PERSPECTIVE

Current Situation

The Carboniferous rocks contain many small aquifers from which the groundwater is mainly discharged as springs. Local public water supplies in Wharfedale and Nidderdale utilise many springs. These sources are often remote, subject to water quality problems after heavy rain and liable to fall to low flows after prolonged dry periods. Groundwater flow in the Carboniferous rocks has been modified extensively in some areas by lead mining, and drainage from the old workings is used for public and private potable water supplies, notably in Greenhow where the Eagle Level is used by YWS Ltd. There are many licensed spring abstractions in Nidderdale and Wharfedale that provide domestic and agricultural supplies, and these form the majority of abstraction licences but only a small proportion of the authorised abstraction (see map 10). It is likely that there are small exempt borehole and spring abstractions used for domestic purposes, but the NRA does not have complete details of all exempt abstractions.

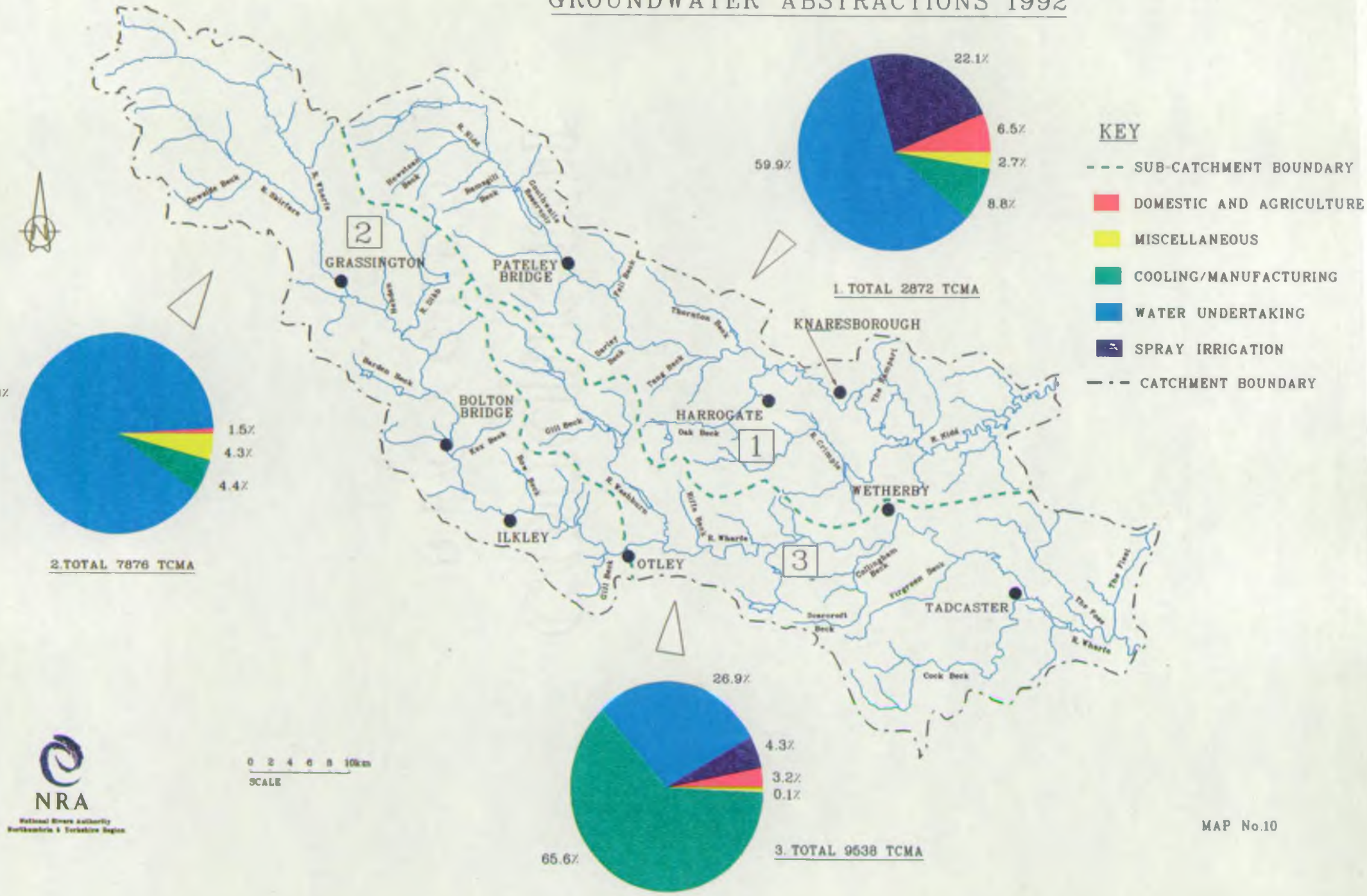
The Magnesian Limestone is utilised for minor and major groundwater supplies. Most of the licences are for domestic and agricultural supplies and for spray irrigation. The major abstractions are in the Tadcaster area where the breweries take large volumes of water.

The Sherwood Sandstone is a major aquifer in the lower reaches of the Nidd and Wharfe. There is one licensed YWS Ltd borehole abstraction from the Sherwood Sandstone which provides public water supply to Leeds, Bradford and Harrogate.

Groundwater abstraction for public supply is the most significant use of groundwater.

Although a large number of domestic and agricultural boreholes exist throughout the catchment the total volume authorised for abstraction is small.

RIVERS NIDD AND WHARFE CATCHMENT
GROUNDWATER ABSTRACTIONS 1992



MAP No.10

Spray irrigation licences represent only 5.1% of the total, annual licensed abstraction, but may represent a significant impact in dry years when they are utilised, and because the abstraction takes place during a short season. The NRA has licensing guidelines to minimise the impact of spray irrigation groundwater abstractions on spring and surface flows.

Future Situation

The NRA "Policy and Practice for the Protection of Groundwater" provides the guidelines and the measures that the NRA will take to protect the quality and quantity of groundwater sources.

The policy classifies aquifers into the major aquifers, such as the Magnesian Limestone and the Sherwood Sandstone, and the minor aquifers, the Carboniferous Limestone, the Millstone Grit and Coal Measures. The vulnerability of the aquifer to pollution is assessed from the type and thickness of the soil and drift cover. A series of protection zones will be delineated for the major groundwater sources, in particular the public water supply sources. The protection zones comprise an inner, outer and entire catchment zone for each source. The document contains guidelines indicating the NRA's likely response to potentially polluting activities within the various protection zones. These activities include; waste disposal to land, contaminated land, application of sludges/slurries to land, discharges to underground strata and diffuse pollution etc. Protection zones are in the process of being prepared for the more vulnerable sources.

A number of groundwater sources (especially in the Sherwood Sandstones), have significant nitrate levels originating from agricultural fertilisers. Other than the high nitrate levels there are no known major groundwater contamination problems within the catchment and every effort will be made to maintain the current situation. The new NRA Groundwater Protection Policy will be used when considering applications for developments which could compromise the quality of groundwater sources.

4.3 EFFLUENT DISPOSAL

GENERAL

The disposal of effluent derived from industry, sewage treatment works, sewerage systems, domestic properties and agriculture can have a significant impact on river and groundwater quality. In cases where there is insufficient treatment or inadequate dilution water quality deteriorates and river uses are affected.

Management Framework

Effluent discharges are controlled by consents which impose conditions to regulate the quality and quantity of the discharge. Consent conditions are set taking account of the upstream quality, the dilution available and the quality required downstream.

The NRA constantly reviews all discharge consent conditions to ensure that the receiving watercourse achieves the necessary standards. The review may result in the variation of an NRA consent or where prescribed processes are involved, the issue of an authorisation by Her Majesty's Inspectorate of Pollution (HMIP). Within an HMIP authorisation any conditions required to protect water quality are set by the NRA.

When setting new consent standards, the NRA needs to identify a reasonable and practicable timescale for the discharger to carry out required improvements.

LOCAL PERSPECTIVE

Current Situation

In the upper valleys of the Nidd and Wharfe the river flows through sparsely populated areas where livestock farming is the predominant industry. Mineral extraction is centred on the Grassington area while in the lower reaches the paper/board mills are situated along the centre of the Wharfe catchment.

Minor sewage treatment works (STWs) serve the smaller communities situated along the upper valleys of the Nidd and Wharfe, due largely as a result of geography and population distribution, the larger STWs being found in the lower valleys around Harrogate on the Nidd and between Ilkley and Tadcaster on the Wharfe.

The main sources of sewage effluent are from STWs and combined sewer overflows (CSOs), almost all of which are owned and operated by Yorkshire Water Services (YWS) Ltd. There are 42 community sewage treatment works in the catchment of which 27 serve a population greater than 250 p.e. (see map 11).

RIVERS NIDD AND WHARFE CATCHMENT

SEWAGE TREATMENT WORKS

SEWAGE DISCHARGES > 250 P.E.

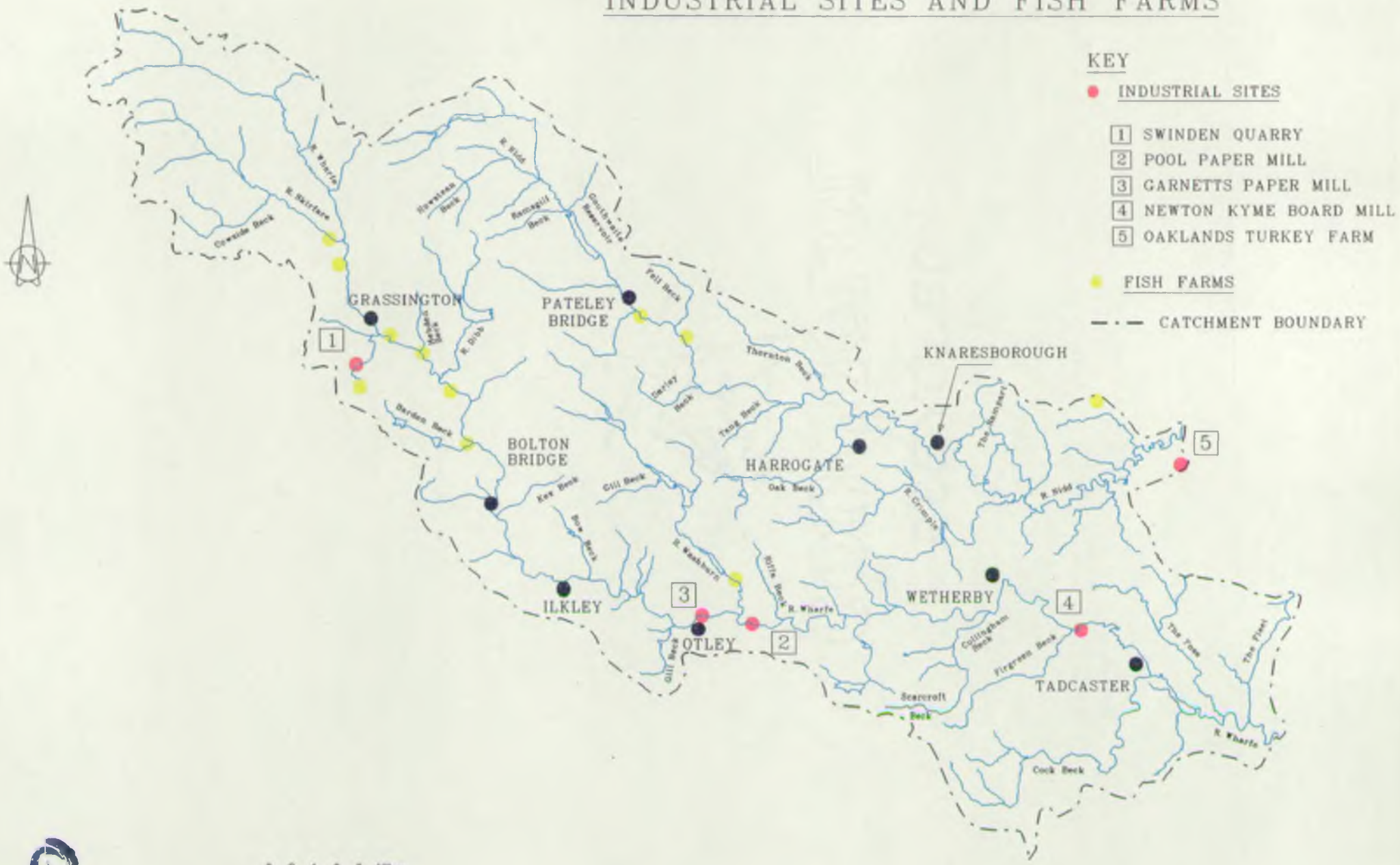
1. KETTLEWELL
2. GRASSINGTON
3. HEBDEN
4. DRAUGHTON
5. BEAMSLEY
6. ILKLEY
7. BEN RHYDDING
8. GLASSHOUSES
9. BURLEY MENSTON
10. DARLEY
11. OTLEY
12. SHAW MILLS
13. POOL
14. KILLINGHALL
15. WEETON
16. HARROGATE NORTH
17. KEARBY
18. KNARESBOROUGH
19. HARROGATE SOUTH
20. NORTH DEIGHTON
21. BARWICK
22. WETHERBY
23. ABERFORD
24. THORPE ARCH
25. TOCKWITH
26. KIRK HAMMERTON
27. TADCASTER DOMESTIC
28. TADCASTER TRADE

NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No.11

RIVERS NIDD AND WHARFE CATCHMENT

INDUSTRIAL SITES AND FISH FARMS



NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No 12

The large number of consented sewage and trade discharges, 1273, gives a misleading impression of the nature of the catchment. Many septic tanks with discharges to soakaway were consented historically; these consents are in the process of being reviewed or revoked.

At Glasshouses in the Nidd catchment, the STW is situated on two separate sites some distance apart both of which are life expired. A scheme is in its early stages to rebuild the works and consolidate it on one site.

Within the catchment the largest STW's, Harrogate North, Harrogate South and Knaresborough are responsible for the most significant problems.

Harrogate North discharges to the lower reaches of Oak Beck at a point where the water quality is already suffering from a combination of unsatisfactory CSO discharges and wrong connections along its length as it passes through the Harrogate conurbation. The net effect is that the Nidd confluence and the benefit of self-purification is lost where the river receives further sewage effluent discharges.

An unusual situation exists at Tadcaster STW on the Wharfe where one treatment plant deals with domestic effluent and another solely with the trade effluent produced at three large breweries in the town.

Recent major sewage treatment works schemes in the Wharfe valley in combination with other improvements have achieved a water quality of class 1A in the main river down to Boston Spa, where a good quality 1B continues to Tadcaster. The RQO from Ilkley to Tadcaster is 1B. A total of 10 schemes have been completed over a span of two to three years, the most relevant being at Ilkley, Burley-Menston, Otley and Pool.

There are few direct industrial discharges within the Nidd catchment. However, in the Wharfe valley limestone quarrying is a major industry which is continuing to develop. Paper and board mills predominate in the lower catchment at Otley, Pool and Newton Kyme (see map 12). Garnetts Mills at Otley discharge to the YWS Ltd STW at Otley via a private sewer.

The mills have a large appetite for water and consequently their effluents can comprise a large proportion of the river flow, particularly in dry weather flow conditions. It is essential therefore that they are regularly monitored for compliance against consent conditions. A marginal variation in quality can cause quite a measurable effect on river quality in certain conditions.

Limestone extraction around Grassington is extensive, particularly at Swinden where the largest quarry is situated. The large quantities of surface and groundwater generated within the site are heavily laden with solids, much of which is colloidal, requiring quite sophisticated treatment prior to discharge to Linton Beck.

At Moor Monkton, Oaklands Turkeys, a major poultry processing plant discharges to a small tributary of the Nidd. There have consistently been problems in developing reliable effluent treatment due to the nature of the waste. Pollution problems have continued to such an extent that the authority is now considering further action.

Future Situation

Improvements to the quality of the discharge from Glasshouses STW is expected in 1996 following the reconstruction of the works. This should ensure RQO is achieved in the Nidd down to Harrogate.

At Harrogate, major improvements will be required at both North and South works to attain the RQO quality standards for the Nidd and Crimple. As a part of the programme of improvements required in the Harrogate area, drainage area plans are being developed by YWS Ltd for principal towns and settlements with the aim of prioritising problem CSOs for subsequent attention and improvement. Harrogate has been identified as a priority for such improvements relating to Coppice Beck and Oak Beck.

The widening of the A1 trunkroad at Aberford is likely to necessitate the demolition of the sewage treatment works, which will need to be built on a new site. Discussions with YWS Ltd have already commenced on this matter.

The NRA has already entered into discussions with the operators of Swinden Quarry regarding the proposals to further extend the site and for its long term restoration to amenity land. Discussions with the company will continue for some time as the implications for the effluent treatment plant and the receiving watercourse are considerable.

At Newton Kyme Board Mill, the company have made considerable improvements to effluent treatment recently, which has enabled them to achieve the required standard. It is expected, however, that following further negotiations biological treatment will be installed to further reduce BOD so as to ensure consent compliance for the future.

In the lower Nidd, the NRA will require improvements at Oaklands Turkeys. It is our intention to require the company to identify the shortfalls of the present treatment system and to further improve its performance.

4.4 FISH FARMS

GENERAL

High quality rivers have historically been subject to development for fish farm purposes.

Fish farming has expanded rapidly to meet growing demand and can lead to problems, such as the accumulation of organic silts, increased nutrient loading, increased ammonia levels and the escape of non native fish. Changes in practice and better management of fish farms have reduced the decline in water quality to some extent in recent years.

Management Framework

Discharges from fish farms are controlled by consents imposing conditions that regulate the quality and quantity of the discharge.

Consent conditions are set by the NRA, taking into account the upstream quality, available dilution and required downstream quality.

LOCAL PERSPECTIVE

Current Situation

Though fish farms have only presented localised water quality problems in the Nidd catchment, in the Wharfe they are generally situated on smaller watercourses (see map 12), where it is difficult to maintain sufficient dilution during dry weather flow conditions. The effluent in such circumstances can cause a deterioration of the downstream river quality. Problems can also arise from low flows and abstraction structures causing blocks to fish movement.

A comprehensive review has been undertaken of most of the fish farm consents within the Wharfe catchment with a view to tightening consent conditions where necessary to maintain downstream RQO. The proprietors of the Washburn Valley Trout Farm and Yorkshire Salmon of Hebden in particular are now under some pressure to meet these targets set by the NRA.

There have been significant escapes of rainbow trout into the river from fish farms in the Glasshouses area. These have interfered with angling and could have had a detrimental impact on the ecology of the river. The NRA seeks to ensure that fish farm owners take active measures to minimise these occurrences and their impacts through adequate screening.

Future Situation

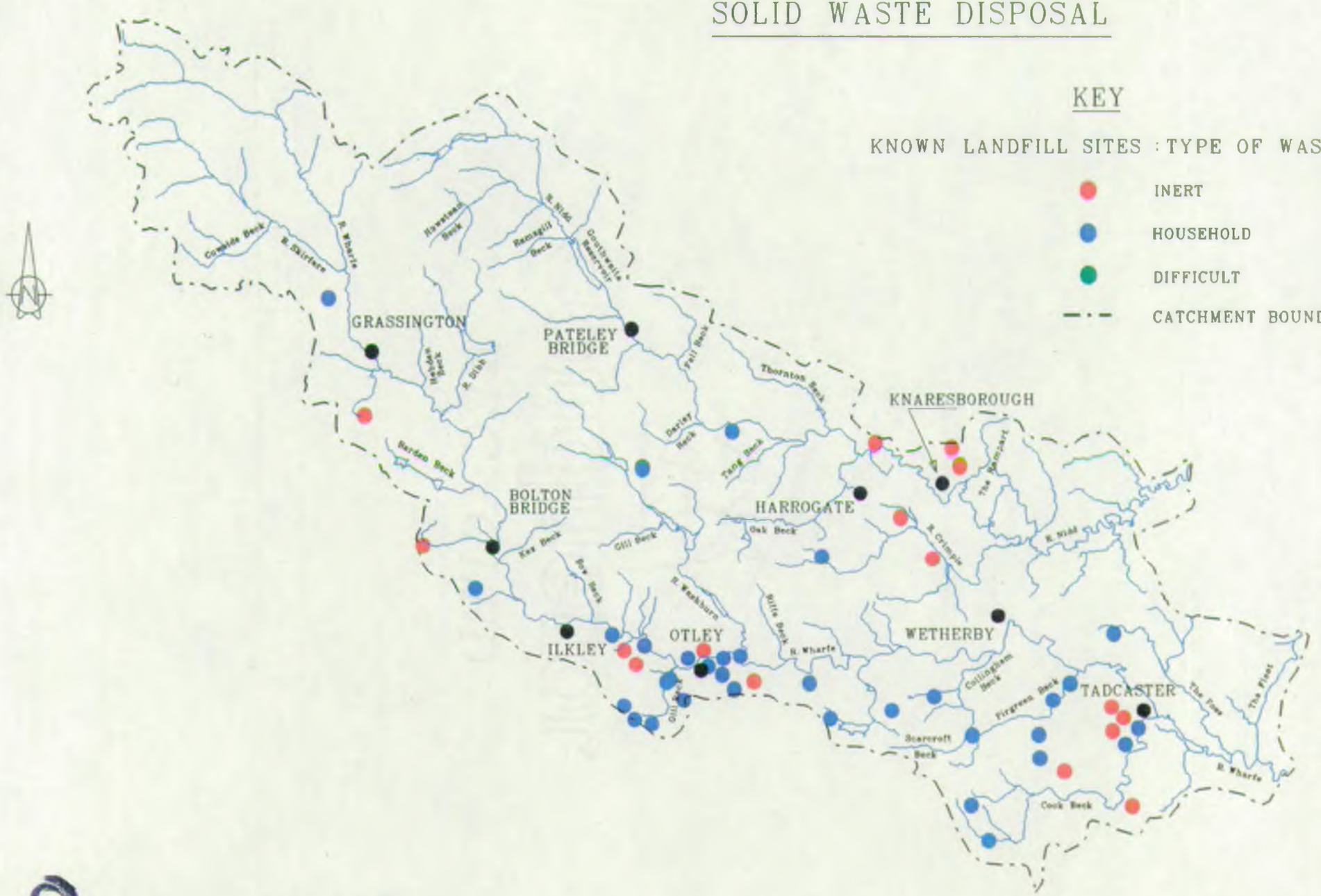
The development of new and existing fish farms in the catchment will require careful control if deterioration of water quality and adverse affects on fisheries are to be avoided. Where consents for existing farms have been tightened, as in the case of the Washburn Valley Trout Farm and Yorkshire Salmon for example, pressure must be maintained on the discharger to ensure compliance with the more stringent conditions.

In all cases a minimum treatment of settlement will be a prerequisite for a site, whereas in some situations biological treatment may be a requirement to achieve the necessary standards of discharge. Small streams may not be suitable for establishment of fish farms.

Kilnsey Park is the only remaining fish farm that requires a consent review. Due to the complexity of the site and need to investigate its influence on the White Beck, it has been scheduled for a major review in 1994.

RIVERS NIDD AND WHARFE CATCHMENT

SOLID WASTE DISPOSAL



NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No.13

4.5 SOLID WASTE DISPOSAL

GENERAL

Waste disposal to land can affect the water environment mainly as a result of leachate produced by the action of water on decomposing waste. Leachate will contain a wide variety of different constituents depending on the waste which has produced it. The polluting potential of the leachate can therefore vary widely. Waste disposal sites can affect both surface and groundwater. A site may leak through the base and therefore have an impact on groundwater which may then appear on the surface and affect surface water. Leachate may also escape from the sides of a site and have a direct input into surface water. Currently sites which will receive waste with a potential to produce leachate have to be constructed on a containment basis. This requires that a site is lined with a very low permeability liner, eg clay or plastic. In some cases a composite liner of clay and plastic is specified.

Management Framework

Responsibility for the regulation of waste disposal sites falls to the Waste Regulation Authority (WRA) in whose area the site lies. The NRA is a statutory consultee to the WRA's and is consulted on all applications for waste disposal licences. The NRA is also consulted on all planning applications for waste disposal operations by the local planning authorities.

Operations of waste sites are monitored by the WRA's who check that the types and quantities of waste, and other operational parameters comply with the conditions of the waste disposal licence. Conditions of the licence may require surface and groundwater to be monitored to ensure the site is not causing pollution. The NRA will also monitor waters in the vicinity of a site for its own records. The NRA is in constant contact with the WRA's and may be involved at any stage in the life of the site.

LOCAL PERSPECTIVE

Current Situation

The majority of waste within the catchment is disposed of at landfill sites (see map 13). Some small scale incineration does exist but this is mainly at specific industrial sites for their own waste.

A number of the waste disposal sites are former or active quarries, the voids left being engineered prior to filling commencing.

A large number of smaller sites occur within the catchment but many are in association with a companies activities and are used only for their purposes.

The NRA is working with the WRA's to ensure all sites are appropriately conditioned to protect the water environment and that licensed operations comply with the conditions imposed.

Sun Lane waste disposal site is located in Burley in Wharfedale adjacent to Sun Lane Beck and Ben Rhydding Beck. The site operated as a domestic landfill site until the early 1970's. It soon became evident that the tip was causing a problem to Sun Lane Beck through high ammonia levels in the discharge from a culvert passing through the body of the landfill. There was also considerable ochre staining of the stream bed.

Various proposals were submitted to ameliorate the problem and work is currently under way to construct a treatment plant consisting of flocculation after pH adjustment to remove the iron followed by seven stage reedbed treatment.

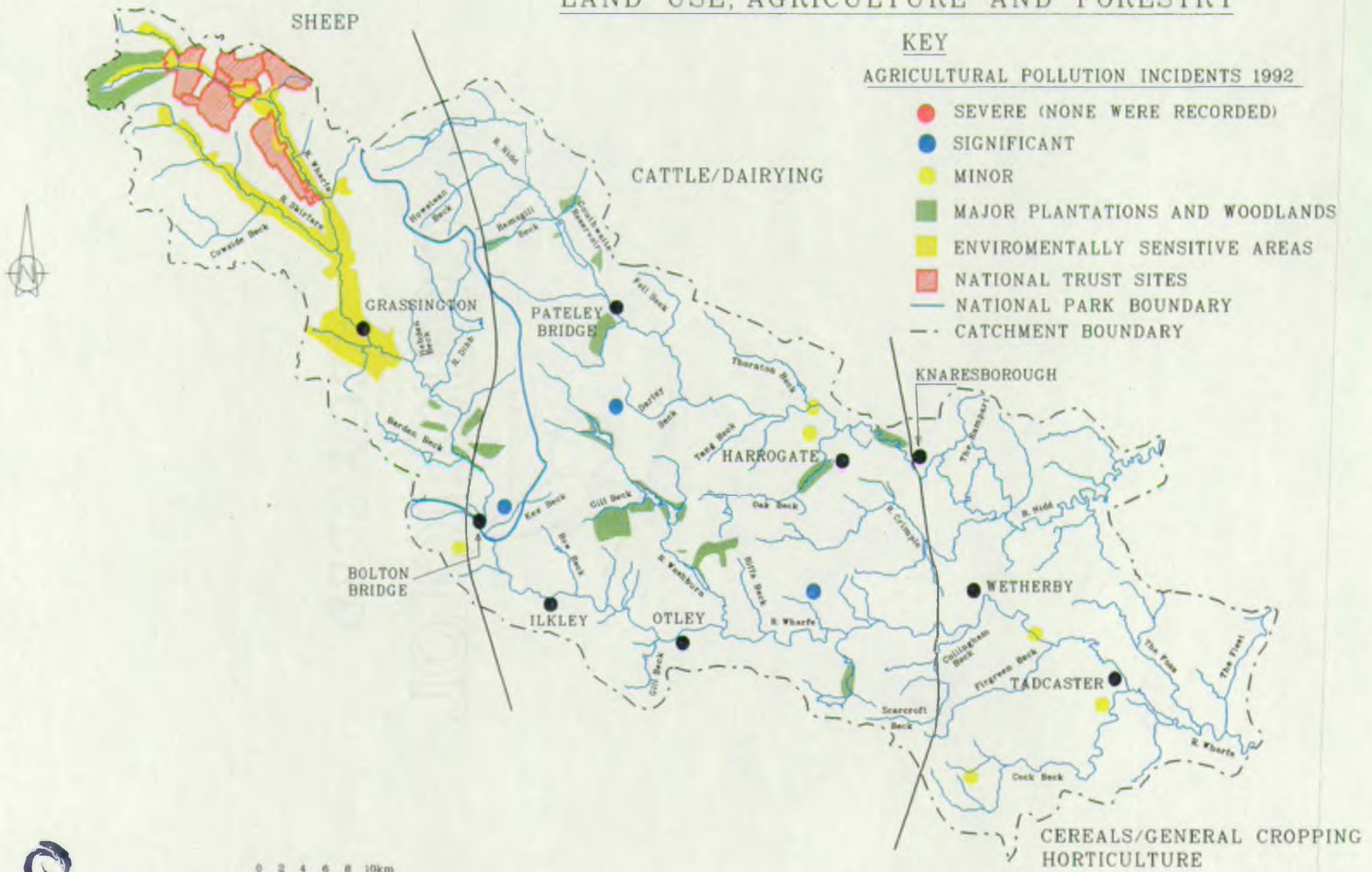
Future Situation

It is anticipated that waste disposal to land will continue for a significant time within the catchment. It is hoped that initiatives such as waste minimisation and recycling will reduce the demand for landfill.

The NRA will continue to work with the WRA's to safeguard the water environment.

RIVERS NIDD AND WHARFE CATCHMENT

LAND USE, AGRICULTURE AND FORESTRY



NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No 14

4.6 LAND USE, AGRICULTURE AND FORESTRY

GENERAL

Land-use and land cover can have a considerable impact on the physical and chemical condition of surface and groundwaters. The way in which land is used, whether for forestry, agriculture or urbanisation will affect not only the adjacent watercourse but considerable distances downstream. Good land management within the catchment is, therefore, seen as vital in maintaining and improving the water environment.

Management Framework

Agricultural pollution prevention has been greatly aided by the introduction of the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991. These regulations ensure that new or substantially altered farm waste storage facilities comply with minimum size and construction criteria.

Forestry in Britain is controlled by the Forestry Commission which has recently been split into Forest Enterprise and The Forest Authority. Forest Enterprise runs the land holdings of the commission like a commercial enterprise whilst the Forestry Authority sets standards for the forestry industry, runs grant schemes to help private woodland owners and ensures the regulations for plant health and tree felling are complied with.

European Community Directive No 85/337, which relates to environmental impact assessments, states that projects which may have significant effects on the environment, for example because of their size or nature, must have an assessment of those effects. The Directive specifically includes initial afforestation where this may lead to ecological changes. The Environmental Assessment (Afforestation) Regulations 1988 (SI 1988/1207) carry out the Directives' rules throughout Great Britain, and are overseen by the Forestry Authority.

LOCAL PERSPECTIVE

Current Situation

Upper Nidderdale is predominantly moorland and pasture, becoming progressively more improved agriculturally downstream. The upper catchment of the Nidd supports larger areas of woodland than the rest of the catchment especially the lower reaches where wooded areas are very limited (see map 14). Yorkshire Water Services Ltd manage predominantly coniferous forestry plantations in the upper catchment and landowners have set aside areas of land which are dedicated to managed forestry comprising conifer, broad leaved and semi-natural woodlands. The Forestry Authority have also carried out a considerable amount of work in the Nidderdale Area of Outstanding Natural Beauty (AONB), which extends into the Wharfe catchment to promote forestry management schemes and grant-aided planting.

Upper Wharfedale is a flat bottomed, glaciated valley up to 500m wide. The valley sides are steep, with limestone cliffs leading up to flatter moorland. The majority of the catchment is rural, with land cover being split between arable, improved grassland, moorland, coniferous and deciduous woodland. There are large coniferous forestry plantations in the upper catchment, notably Langstrothdale and lower in the catchment around the reservoirs on the River Washburn. The Forestry Authority has produced a third edition of 'Forest and Water Guidelines' which advises owners and managers how woodlands and forests influence the freshwater ecosystems and gives guidance on how to carry out operations sympathetically.

The upper catchment of the Wharfe lies within the Yorkshire Dales National Park (YDNP). This has implications for land use through planning restrictions and land management techniques used within the park boundaries. The park authority together with the NRA seek to restrict development that threatens surface water quality and encourage initiatives to improve quality.

Upper Wharfedale also falls within the Pennine Dales Environmentally Sensitive Area (ESA). Environmentally Sensitive Area agreements cover Langstrothdale, Wharfedale and Littondale. Within the delineated area landowners can voluntarily enter into an agreement which lasts for at least five years. The scheme, introduced by MAFF, protects some of the most beautiful parts of the country by providing assistance for retaining landscape features and reconciling conservation with commercial farming. The whole of Langstrothdale has taken up the agreement and approximately 65% of the Wharfedale and Littondale ESAs. Within the ESAs, the National Trust own 5200 acres of tenanted farmland and 2000 acres of common land. Most of the tenant farmers are taking part in the MAFF scheme.

The NRA is working with landowners, the Forestry Authority and Yorkshire Dales National Park Authority to encourage farmers to enter the ESA agreement.

Future Situation

The current over-capacity within agriculture offers unprecedented opportunities for the NRA to influence land use changes to benefit and improve the water environment. Numerous grants and subsidies currently exist encouraging farmers to reduce agricultural productivity. Presently, both deciduous and coniferous forestry schemes are grant aided by the Forestry Authority with the Woodland Grant Schemes encouraging the creation of new woodlands and good management of existing areas. However, at the moment, other grants mean that the incentives to plant trees are generally not being taken up.

Of considerable interest to the NRA is the existing Set Aside Scheme and the Water Fringe Option of the newly proposed MAFF Agri-Habitat Scheme, which provides grant payment to farmers to establish "buffer zones" alongside watercourses to protect the aquatic environment.Such areas once removed from intensive production, should serve to improve the physical, chemical, biological and conservation aspects of the watercourse through amelioration of diffuse pollution, sediment loss and habitat degradation.

The Yorkshire Dales National Park Authority are in the process of producing an indicative forestry strategy which will give guidelines for forestry within the Yorkshire Dales National Park. Strategies also being produced by the NRA will help identify areas of mutual interest between both organisations.

The NRA has recently been involved with a collaborative project with the Farming and Wildlife Advisory Group (FWAG) involving the preparation of Farm Conservation Plans within the catchment of the River Nidd. It is hoped that these links will continue in the future promoting sympathetic land-use and enhancing the conservation value of both Nidd and Wharfe catchments.

The NRA is involved with an initiative of North Yorkshire County Council and Harrogate Borough Council, aimed at conserving and improving features in the landscape of the lower Nidd. A similar project is also running to improve habitats for barn owls in the Harrogate area.

4.7 CONSERVATION

GENERAL

The character of a river is highly influenced by the surrounding land use and riverside habitats. A healthy river and its adjacent 'corridor' in terms of conservation value is characterised by ecological diversity and abundant plant and animal communities, which enhance the overall quality of the landscape.

In some areas, land use is controlled by designations for conservation. These designations may protect ecologically or historically important sites and vary in their powers in controlling land management policies.

Management Framework

In England, English Nature are the statutory body responsible for Sites of Special Scientific Interest (SSSI) and National Nature Reserves whilst English Heritage is the statutory body for historical features. Local Authorities are empowered to designate sites of local and regional interest through consultation with English Nature.

The duties of the NRA with reference to conservation are laid out in Sections 2, 16, 17 and 18 of the Water Resources Act 1991. These require the NRA to promote the conservation of flora, fauna, geological and physiographical features of special interest and the enhancement of natural beauty. These duties apply to work done by the NRA and by other organisations carrying out works consented by the NRA where conservation aspects are specifically detailed.

LOCAL PERSPECTIVE

Current Situation

The catchment of the Nidd from its source adjacent to Great Whernside just outside the Yorkshire Dales National Park down to Birstwith lies within the Nidderdale Area of Outstanding Natural Beauty (AONB), an area noted for its landscape features. This upland section of the river contains 5 SSSIs all of which are located close to or adjacent to the river (see map 15).

Gouthwaite Reservoir SSSI covers 165 ha and is important as a sanctuary for breeding and wintering birds. Upper Nidderdale SSSI is of geological interest, including caves of high visual and hydrogeological interest. Greenhow Quarry is also a site of geological interest while Greenhow pasture, comprising a number of fields, is noted for its neutral grassland flora.

RIVERS NIDD AND WHARFE CATCHMENT

NATURE CONSERVATION

KEY

- SITES OF SPECIAL SCIENTIFIC INTEREST
  Wildlife and Countryside Act 1981
- NATIONAL NATURE RESERVE
  National Parks and Access to the Countryside Act 1981
- PROPOSED NATIONAL NATURE RESERVE
- LOCAL NATURE RESERVE
  National Parks and Access to the Countryside Act 1949
- NIDDERDALE AREA OF OUTSTANDING NATURAL BEAUTY
- YORKSHIRE DALES NATIONAL PARK BOUNDARY
- CATCHMENT BOUNDARY

NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No 15

Moorland, reservoirs and woodland contribute to the conservation interest of the upper and middle catchment down to Harrogate, especially the diverse range of migratory bird species. The trees lining the river bank are predominantly alder. Where the upland grassland is influenced by the underlying carboniferous rocks, limestone rich grassland develops which is often of high conservation value.

The reservoirs on the Nidd are significant ornithologically and regularly attract many rare passage species in addition to breeding waterfowl.

Birkham Wood SSSI is situated on the south bank of the River Nidd near Knaresborough and comprises one of the most diverse examples of semi-natural, broad-leaved woodland remaining in the Vale of York. It also supports a range of breeding birds.

Aubert Ings is an area on unimproved natural grassland close to the village of Cattal and within a meander of the River Nidd. Traditional management of this ings land sustains an important variety of grassland and herb species.

The Local Nature Reserve, Hookstone Wood and Ponds, on the River Crimple was designated in 1991 for its breeding damsel and dragonflies and invertebrate interest.

As well as these designated sites of conservation interest, the river and its catchment has a large number of locally identified sites of high conservation value such as the Nidd Gorge, near Knaresborough which supports common sandpiper, dipper, kingfishers and deer, and is also of botanical interest. Oak Beck, a tributary of the Nidd, has a non-statutory site at Birk Crag where marsh and rare bog plant species, plus nationally rare insects are present.

The Wharfe catchment contains 40 SSSI's, a National Nature Reserve and a Local Nature Reserve. In addition to these designated sites there are a number of sites which have been identified by Local Authorities and other organisations as being of high conservation value. A provisional assessment of riverine habitats carried out by NRA staff along the Wharfe and its tributaries indicates that the upper stretches are of very high conservation interest, which is recognised by the YDNP, AONB and the high number of designated SSSI's in this area. As the catchment passes out of the Yorkshire Dales National Park the areas of high conservation value are more scattered and the linking of these sites is an important objective.

The upper catchment is a carboniferous limestone dale including various cave systems and supporting a diverse range of flora and fauna. The moorlands are noted for their upland wader populations, particularly of dunlin and golden plover. Oughtershaw Meadows SSSI in the headwaters of the river provides an example of a range of upland plant communities in agriculturally unimproved grassland.

The river itself is an SSSI for 4.4 miles from Buckden to Kettlewell with both dipper and kingfisher frequenting this stretch of river. The nationally rare northern spiked rush *Eleocharis austriaca* favours the wet hollows and meanders.

Skoska Wood SSSI on the River Skirfare supports flush communities in herb-rich, neutral or calcareous pasture where springs rise.

Strid Wood SSSI at Bolton Abbey is an acidic oak wood with the river dissecting the millstone grit and carboniferous limestone to form a steep sided valley. The wood also supports a wide range of bird species.

Eccup Reservoir SSSI supports the locally rare bladder sedge *Carex vesicaria* and is especially significant in terms of wintering wildfowl, such as wigeon, teal, pochard and goldeneye.

Stutton Ings SSSI, situated on Cock Beck in the Vale of York near Tadcaster is a remnant of traditionally managed grassland. The valley here is wide and flat, with annual flooding. Cawood Meadows, a non-statutory site, is an example of unimproved grassland noted for its entomological, ornithological and amphibian interests.

There is evidence that both rivers support scheduled mammals, such as the otter. With further enhancement and improvement of the river corridor these could be encouraged to return permanently. The NRA's part in this process is through contact with outside organisations, landowners and individuals.

Both rivers also support populations of native white-clawed crayfish *Austropotamobius pallipes*. However the presence of American signal crayfish (*Pacifastacus leniusculus*) in the Wharfe and tributaries from Kilnsey Crags to Boston Spa gives cause for concern as they may affect the populations of native crayfish in the river. Grassington is the furthest upstream that the native crayfish has been recorded and further work needs to be carried out to discover the range of both the native and the invading species.

Future Situation

Article 10 of the European Habitats Directive 92/43 aims to promote the linking of sites of high conservation interest to form linear ecological corridors. The idea is to ensure that sites are taken in the context of the wider landscape. Future opportunities may arise to develop the watercourses of the Nidd and Wharfe catchments as ecological corridors, thus promoting a network of interlinked sites.

Existing wildlife, their habitats and protected species must be given the protection they require under the existing legislation.

Collaborative ventures with other organisations and landowners should be increased to achieve further environmental improvements.

4.8 ARCHAEOLOGY AND HERITAGE

GENERAL

The landscape of Britain contains a rich heritage of historic and archaeological features. These can vary from megalithic monuments, Roman remains, castles, deserted villages, ecclesiastical buildings, great halls and bridges down to single coins and flints. Some sites protected or managed for their historic interest are also valuable for wildlife and as a result can form important habitats. However there is a growing concern for the impact of intensive agriculture and the application of fertilisers and chemicals on the integrity of archaeological features. Archaeologically, rivers, lakes, and alluvium-covered area are important because of the types of site preserved, and the possibility of anaerobic conditions permitting the preservation of organic materials. Of all landscape environments, rivers, lakes and alluvium spreads are possibly the least well documented archaeologically, probably because, until disturbed, remains preserved in these areas are among the best protected in the country.

Management Framework

The NRA has a duty to have regard to features of archaeological and historic interest during all aspects of NRA work under the Water Resources Act 1991. However, the principal legislation affecting ancient monuments in England is contained in the Ancient Monuments and Archaeological Areas Act 1979, which was subsequently amended by the National Heritage Act 1983. The Secretary of State is required to compile and maintain a schedule of monuments to which statutory protection is afforded.

Historic Landscapes within the catchment are designated by English Heritage, whilst Scheduled Ancient Monuments (SAM) are designated by the Department of National Heritage on advice from English Heritage. Other historical and archaeological sites may fall within areas designated as Environmentally Sensitive Areas by MAFF or be covered by the Countryside Stewardship agreement with the Countryside Commission.

LOCAL PERSPECTIVE

Current Situation

The changing aspects and historical usage of the catchments are reflected in the archaeology of both rivers.

There have been archaeological finds in the Yorkshire Dales dating back to the Mesolithic period, and farming tools from the Neolithic and Bronze Ages have been found extensively in Nidderdale. Upper Wharfedale is rich in archaeological remains, such as burial mounds, and there is much evidence of Iron Age settlements, such as Close Farm Settlement on the moors north of Grassington.

There are 119 Scheduled Ancient Monuments (SAMs) within the two catchments, the River Wharfe has 95 and the Nidd 24. The main sites are shown on map 16. Both catchments contain numerous grade 1 and 2 listed buildings and several designated conservation areas.

Several of the bridges within the Nidd catchment are designated SAMs namely Pateley Bridge, Birstwith, Hampsthwaite, Killinghall, Knaresborough High Bridge and Cattal bridges. Similarly on the Wharfe, bridges have been designated in Barden, Ilkley and Otley. Other SAMs include Roman remains, deserted villages, ecclesiastical buildings and structures, halls and castles.

The Wharfe catchment contains a variety of Roman remains such as auxiliary forts, marching camps, roads, villas and settlements. There are auxiliary forts at Newton Kyme, near Tadcaster, and Ilkley (Olicana), both of which were built adjacent to the River Wharfe. The fort at Ilkley now lies buried in the centre of the town, although Newton Kyme remains visible.

The Roman road of Rudgate crosses the Wharfe at Newton Kyme, the Nidd at Cattal and continues north to Boroughbridge. A road connected York via Tadcaster to Ilkley and on to Long Preston, while another road connected the Roman town of Aldborough with Ilkley. It was during the Roman occupation that the lead deposits in Upper Nidderdale began to be exploited.

A number of important battles were fought within the catchment. The battle of Towton fought in the fields adjacent to Cock Beck in 1461 saw a crushing defeat for the House of Lancaster. It is believed that they became bogged down in waterlogged land adjacent to the stream. In 1642 there was a battle for Tadcaster Bridge and 1644 saw the battle of Marston Moor between the Parliamentary Army and Royalist forces north of the village of Long Marston.

Bolton Abbey and Barden Tower are well known features of Upper Wharfedale. The abbey was established in 1155 by Augustinian monks. Byland and Fountains Abbeys, although located outside the Nidd and Wharfe catchment had much of their land located in Nidderdale, as well as an outlying lodge at Kilnsey in Wharfedale. Barden Tower was constructed in the 15th century and rebuilt in 1657. Although ruined, it has been partially restored and offers accommodation in the form a bunkhouse barn.

There are several weirs on the Wharfe and Nidd. Some, such as Pool and Otley, continue to support the needs of industry for water. Others, such as Addingham, Boston Spa, Wetherby and Burley-in-Wharfedale on the Wharfe and Glasshouses, Low Laithes and Hunsingore on the Nidd remain even though the heavy industry has gone.

Mineral springs and the 19th century fashion for 'taking the waters' led to the popularity of Harrogate and, to a lesser extent, Boston Spa as resorts.

RIVERS NIDD AND WHARFE CATCHMENT

ARCHAEOLOGY AND HERITAGE

NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No.16

Future Situation

All County Councils in the area maintain a detailed list of known archaeological sites, the Sites and Monuments Record, and these are updated as fresh information is made available as a result of new excavation and survey work. The NRA recognises the County Sites and Monuments Record as the primary source of archaeological information and advice and will consult them as a matter of course regarding such data.

Any new designations will be notified to the NRA who will ensure accurate, up to date listings are maintained.

The NRA aims to improve links with county archaeologists and other appropriate organisations. Wherever possible, the NRA will continue to seek to protect sites associated with watercourses from direct damage and from drying out. At present, legislation often only protects the monument itself or a specific building. In future sites may well include adjacent land in context with the scheduled monument. This will have implications for the NRA where a site is adjacent or close to a watercourse.

4.9 AMENITY AND RECREATION

GENERAL

A significant use of the water environment by man is for amenity and recreation. This is now recognised as an industry which plays a vital role in the local economy even in areas where there is no direct charge for the use of water and associated amenities. Passive or informal recreational use of water includes viewing scenery, walking near water and enjoying the environment, fauna and flora to be found in, on or near the water. Active recreation associated with water includes uses such as rowing, sailing, canoeing and angling. Angling is a very important recreational pursuit within the catchment which is discussed in more detail later in the document.

Management Framework

There is an extensive network of public footpaths and bridleways within the catchment, otherwise access to the still waters and some parts of the river is controlled by landowners.

Other recreational activities are permitted at different places by formal and informal agreements between the landowners and sports clubs, societies, groups and individuals.

The NRA has a duty to take into account recreation in the performance of all its functions and it can pass byelaws under Section 210 of the Water Resources Act 1991 for purposes connected with carrying out its functions.

The NRA has a vital role to play in liaising with and advising other bodies to ensure that a co-ordinated approach is taken to the strategic management and development of recreation which allows the optimum potential of a water body to be realised.

LOCAL PERSPECTIVE

Current Situation

Since the upper reaches of the Nidd and Wharfe lie in the Nidderdale Area of Outstanding Natural Beauty and the Wharfe also lies within the Yorkshire Dales National Park, the amenity value of the area is considerable. Walking is a major pastime, with several well-defined, long distance paths crossing the catchment of the two rivers. The 270 mile Pennine Way skirts the top of the catchment and crosses the Dales Way, a popular 80 mile route which follows the course of the River Wharfe from Ilkley to the head of the catchment on Oughtershaw Side and finishes at Bowness on Windermere. The 70 mile Ebor Way starts in Ilkley passing through York on the way to Helmsley. Within the Nidd catchment there is the Nidderdale Walk which covers approximately 53 miles from Hampsthwaite to Scar House through Nidderdale and the Pioneer Walk a 66 mile walk via Dacre Banks, Linton, Malham and Kettlewell which links youth hostels.

RIVERS NIDD AND WHARFE CATCHMENT

AMENITY & RECREATION

KEY

MAJOR LONG DISTANCE WALKS

- PENNINE WAY
- DALES WAY
- NIDDERDALE WAY
- EBOR WAY
- AINSTY BOUNDS WALK

WATER BASED ACTIVITY

- CANOEING
- ROWING
- SAILING
- CATCHMENT BOUNDARY
- NAVIGABLE REACHES

0 2 4 6 8 10km

SCALE

NRA

National Rivers Authority
Northumbria & Yorkshire Region

MAP No 17

There are three circular routes within or crossing the catchment, the 44 mile Ainsty Bounds Walk, via Tadcaster through the Vale of York follows footpaths along the banks of the river bounding the Ainsty area, including the Rivers Wharfe, Ouse and Nidd. The Otley Nine Leagues runs for 27 miles through woodland and alongside rivers and open fields from Otley Chevin visitors centre around Pool-in-Wharfedale and Ilkley, while the Dales Traverse passes over rough grazing and limestone pasture via Kilnsey. The major long distance walks are shown on map 17.

In addition to the long distance walks there are many short walks which focus in and around the two rivers and their tributaries. There are specially designed walks around the old lead workings on Grassington Moor near the Wharfe and around Ashfoldside Beck on the Nidd. The Valley of Desolation and 'The Strid' on the Bolton Abbey Estate are also well featured in the walking guides of the area. Harrogate District Council have spent the last couple of years uprating the footpaths and signs within the Nidd Gorge between Harrogate and Knaresborough.

Riverside sites such as the Bolton Abbey Estate, Pateley Bridge, Ripley Estate and Knaresborough act as honey pot sites, providing toilet and parking facilities, drawing tourists away from other potentially more sensitive sites. There are also many sites away from the riverside such as Brimham Rocks near Harrogate owned by the National Trust, providing recreational facilities, car parking, toilet facilities and access for people with disabilities.

Although formally agreed access on both rivers is limited, casual canoeing takes place along much of the length of the Wharfe and on the Nidd down to Knaresborough. The River Wharfe is by far the more important of the two rivers for canoeing and Burnsall is generally seen as being the start of canoeing interests on the river. At Appletreewick, the landowner has created a national canoe slalom course. Access is restricted to weekends to balance the use of the river with angling interests. The canoeists have developed a canoe slalom course of almost international status in the Washburn Valley below Thruscross Reservoir by special arrangement with Yorkshire Water Services Ltd. This arrangement arises due to the fluctuations in the water level of the river and reservoir. Yorkshire Water Services Ltd allow the water to build up, when flows permit, and release it at a controlled rate over a weekend to enable events to be held on the slalom course.

There is some potential to improve access for canoeists on both rivers without having a detrimental impact on other riverside recreation.Most of the reservoirs controlled by Yorkshire Water Services Ltd are open to public access, with picnic facilities, car parking and toilets. Grimwith and Thruscross in the Wharfe catchment also provide sailing facilities and Scargill Reservoir in the Nidd catchment provides facilities for model boating.

There is considerable ornithological interest in the two catchments with many of the reservoirs supporting wintering wildfowl. The remote headwaters of the River Nidd and the location of Scar House and Angram Reservoirs provide habitats for a number of species, particularly birds of prey. Records of golden eagle now come from upper Nidderdale annually and the area is renowned for other less common species such as peregrine falcons.

Gouthwaite Reservoir is considered to be of prime ornithological importance. Designated a nature reserve by Yorkshire Water Services Ltd in 1977, the site is managed with advice from an expert committee of naturalists in the interests of conservation. Yorkshire Water Services Ltd do not issue permits for birdwatching. However, the public highway between Pateley Bridge and Ramsgill runs close to the reservoir for its entire length on the western side affording excellent opportunities for bird watching.

There are a number of other recreational activities undertaken within the Nidd and Wharfe catchments. Grouse shooting takes place at several sites especially on Hebden, Grassington and Barden Moor and on the Bolton Abbey estate. The limestone rocks to the west of Gouthwaite reservoir give rise to plenty of caving interest, in particular at Goyden Pot above Lofthouse and around Howstean Gorge on the Nidd, while rock climbing takes place at Kilnsey on most weekends.

Tadcaster Weir is the tidal and the navigational limit of the River Wharfe. The 9km stretch of the River Wharfe below Tadcaster Weir is an 'Open Navigation'. This means that there is no navigation authority responsible for the general control and monitoring of boating activities on this stretch of river. Due to the physical nature of the river, its width and depth, few boats are thought to use the navigation. There is no recognised navigation on the River Nidd, although boats do occasionally stray in the mouth of the river from the Ouse.

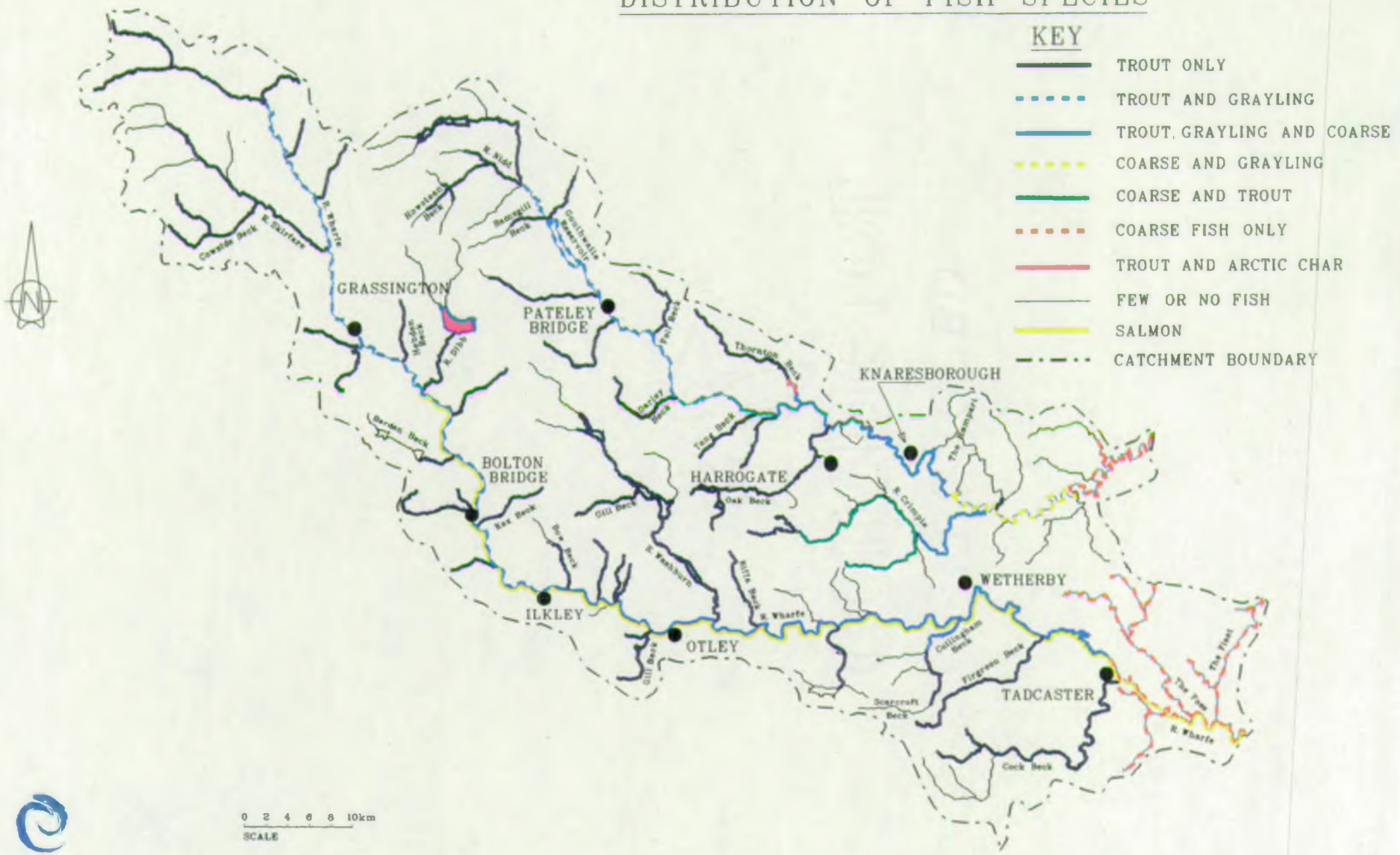
Future Situation

There are no known major initiatives to increase the level of recreational activity within the catchment, although it is the view of the canoeing organisations that access could be improved to both rivers without conflicting with other users.

The NRA will continue to promote suitable recreation on NRA owned riverside land where this will not have a detrimental impact on the other duties of the organisation. Wherever possible, provision will be made for people with disabilities. The NRA will continue to liaise with organisations and individuals interested in promoting recreation and amenity within the two river catchments.

RIVERS NIDD AND WHARFE CATCHMENT

DISTRIBUTION OF FISH SPECIES



NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No.18

4.10 FISHERIES

GENERAL

Fish populations are dependent upon the water quality, quantity and physical habitat for their well-being. Fish populations serve as excellent indicators of the quality of the water environment and generate financial benefits to local communities through exploitation by commercial and recreational fisheries.

Management Framework

In England and Wales, the National Rivers Authority has a specific duty under the Salmon and Freshwater Fisheries Act 1975 to maintain, improve and develop fisheries. This is additional to the more general powers for the enhancement and protection of wildlife under the Water Resources Act 1991, the Wildlife and Countryside Act 1981 and the Control of Pollution Act 1974.

The NRA has duties to further the conservation of the fish community, in addition to its duty to maintain, improve and develop fisheries.

LOCAL PERSPECTIVE

Current Situation

The distribution of fish species in the Nidd and Wharfe catchment is illustrated on map 18.

The Nidd supports a high quality trout and grayling fishery, with trout occurring as far downstream as Knaresborough and grayling down to Tockwith. However, the headwaters upstream of Angram reservoir and several of the tributary becks are virtually fishless, due it is thought to acidity. Some of the tributaries e.g Dauber Gill and Darley Beck, are good trout nursery streams, but others are poor, suffering from organic pollution. Some trout recruitment is also thought to occur in the River Nidd itself.

Gouthwaite Reservoir, noted for its grayling populations which migrate into the upper reaches of the Nidd to spawn in spring, is used for river compensation releases. This has a strong moderating influence on flows throughout the entire length of the Nidd which is felt to be beneficial to the fisheries.

Coarse fish dominate the lower reaches of the river. Dace, chub, gudgeon and the occasional roach, occur in the river downstream of BirstwithWeir, which acts as a significant barrier to upstream fish movement. From downstream of Knaresborough, bream, barbel, perch, pike and ruffe are also common.

A small off-river fish haven was created as part of the scheme to divert the Nidd downstream of Knaresborough when the Harrogate South by-pass was constructed in 1991. The effectiveness of the haven is yet to be demonstrated.

The fishery has suffered from intermittent problems from Harrogate North STW. Oak Beck and Crimple Beck also suffer from intermittent poor water quality, due largely to CSO's and some agricultural pollution, with some effects from Harrogate South STW on the lower Crimple. The physical habitat in the river in the lowest reaches is poor.

Hunsingore Weir constitutes the first effective barrier to migratory salmonids travelling upstream from the Ouse; other weirs, notably at Knaresborough and at Birstwith, would also restrict access to suitable spawning areas for these fish. Skip Bridge Gauging Weir may be a problem for coarse fish migrations from the Ouse and appears to have affected the populations of smaller coarse fish species in the reach below Kirk Hammerton.

Significant populations of brown trout occur in the Wharfe upstream of Wetherby and in most of the tributaries. In the Wharfe above Kettlewell and in most of the tributaries, stocks are maintained by natural recruitment but, in the main river downstream of Kettlewell, the natural recruits are supplemented by stocking, usually with fish of takeable size. Downstream of Ilkley, little successful breeding occurs in the main river and most natural recruits are derived from the tributaries.

Salmon parr and smolts have been stocked into the catchment and parr have been found in tributaries in the vicinity of salmon rearing units. However, although observations of adult salmon ascending weirs are occasionally received and a few dead adults have been found in the lower river, the run of such fish is considered to be small. Poor water quality in parts of the Humber and the lack of fish passes at some weirs are probably the main factors hindering the recovery of this species.

Grayling are found in the Wharfe between Buckden and Tadcaster, occurring most abundantly in the faster reaches. Generally, few are found in the tributaries. In recent years, reports of declines of this species in certain stretches have been received but the evidence is generally scanty and the possible causes remain conjectural.

Larger coarse fish are most abundant downstream of Otley although significant numbers occur up to Ilkley. They are also found in some of the lower tributaries. Roach, dace, chub, gudgeon, barbel are common and some bream are also present. In recent years, numbers of dace have decreased whilst those of perch and chub have increased.

Following a decline in the late 70s and early 80s, the numbers of roach have partially recovered. Pike have recently extended their distribution upstream of Harewood Bridge. Eels are abundant in the lower river but, due to the difficulties in ascending obstructions, few are present in the upper river. Flounders are common in the tidal reaches.

Bullhead, minnow and stone loach are found in the upper Wharfe and most tributaries.

Grimwith Reservoir has been stocked with a strain of arctic char from Windermere as a conservation measure.

Rainbow trout are regularly introduced into some of the reservoirs in the catchment which are operated as put-and-take fisheries.

Future Situation

Fish populations in both rivers are of a high quality and are a reflection of generally good water quality and diverse physical habitat. Thus, the primary requirement is to protect these features.

Some of the Nidd's tributaries, particularly in the middle and lower reaches are severely limited by poor water quality, resulting from bad agricultural practices and combined sewer overflows, exacerbated in some cases by low flows. There is potential for rehabilitating these streams in the future.

The moderating effect on flows in the River Nidd afforded by Gouthwaite is under threat from progressive siltation of the reservoir which reduces its capacity, also by proposals to transfer water from Angram/Scar House Reservoirs to the Wharfe system.

Management of brown trout populations on both rivers should move towards the development of self sustaining stocks. Protection and improvement of spawning and nursery areas should be pursued in order to increase natural recruitment, particularly on the Wharfe. Concomitantly, angling management for brown trout should move away from put-and-take and towards catch-and-release. Together these measures should reduce the requirement for stocking which is known to have adverse effects on wild stocks.

Improvement in water quality in the Humber and the installation and improvement of fish passes at weirs should result in a substantial increase in salmon runs, particularly on the Wharfe. In order to permit the development of a salmon stock genetically adapted to conditions in the Wharfe catchment, further stocking is undesirable. Also to this end, escapes from smolt production units on Hebden Beck and Moss Beck should be prevented. As smolt runs increase, it will become vital to prevent their entrainment and impingement at water intakes. This will require monitoring and remedial action where necessary.

Angling interest in grayling has increased recently. Reports of declines in certain river lengths require validation and the causes of verified declines require elucidation. Subsequently, measures should be taken to remove adverse factors so as to permit the recovery of stocks.

Fluctuations in coarse fish populations usually occur over a relatively long time scale. Large chub of the 1975 and 1976 year classes will dwindle in numbers over the next few years but cyprinids of the 1989-1991 (drought) year classes should become prominent in the fish populations during the next few years. In time, improvements in fish passes should benefit the coarse fish populations by allowing freer movement between spawning, nursery, feeding and overwintering areas.

Water quality in the Nidd itself is threatened by recent and planned large scale developments in the Harrogate-Knaresborough area. These may overload sewer systems and sewage treatment works. There may be impacts on surface water systems from rain-water discharge from such developments particularly from the road widening and ring roads which are planned and being built in both catchments.

4.11 ANGLING

GENERAL

Angling continues to be one of Britain's most popular recreational sports bringing economic benefits to the area.

Management Framework

Fishing rights in non-tidal waters are controlled by the riparian owner who can then lease the rights to angling clubs or syndicates. In tidal waters, fishing rights are normally vested in the Crown, who allow unrestricted angling, but access to the water may be controlled by the riparian owner.

Under the Salmon and Freshwater Fisheries Act 1975 all anglers fishing for salmon, trout, freshwater fish and eels in England & Wales must have a valid NRA rod licence, with this system being enforced by NRA bailiffs.

Commercial fishing for both eels and migratory salmonids is also controlled by the NRA through licences.

Under the Water Resources Act 1991 the NRA has a duty to maintain, improve and develop fisheries under its jurisdiction.

LOCAL PERSPECTIVE

Current Situation

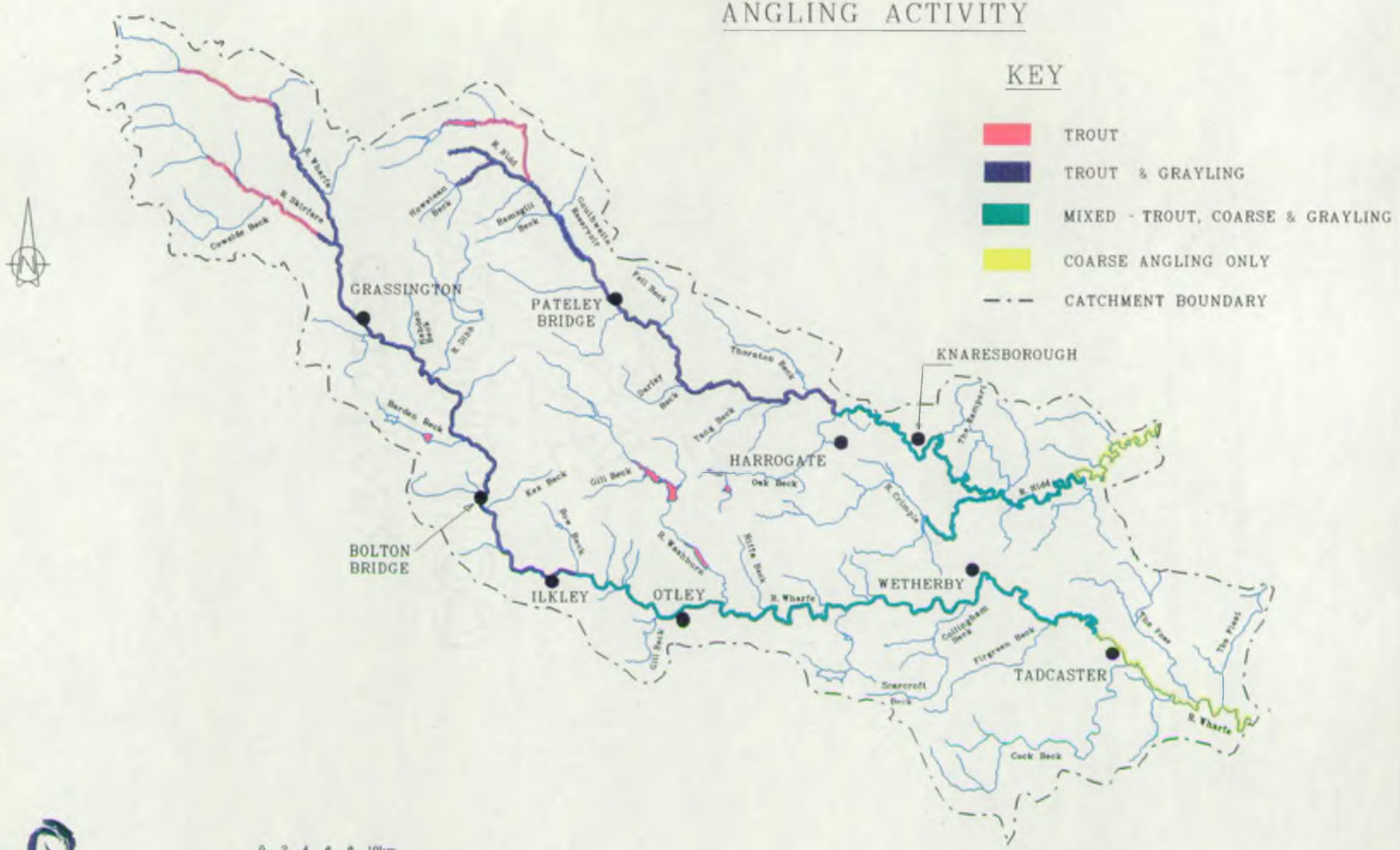
Angling takes place throughout the length of both rivers from their confluence with the Ouse to the upper reaches. The main areas are indicated on the map 19. Coarse, mixed and trout fishing are catered for and, in general, the variety of angling available allows scope from the novice stage to the most experienced angler.

On the Nidd upstream of How Stean Gorge, fishing rights are controlled directly by landowners, and little angling is known to take place. Organised angling on the Nidd begins downstream of Lofthouse, where large angling clubs from Leeds and Bradford control and encourage fly and bait fishing as far downstream as Ramsgill. The clubs do not carry out any stocking in these reaches.

Between Gouthwaite reservoir and the outskirts of Harrogate, locally-based angling clubs, with primary interest in fly-fishing for grayling and trout, control much of the fishing rights. Some day ticket fishing is available, and restocking with brown trout, is undertaken by local clubs.

RIVERS NIDD AND WHARFE CATCHMENT

ANGLING ACTIVITY



NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No.19

The first major coarse fishing interest occurs downstream of Killinghall, with coarse angling matches regularly hosted by Harrogate and Knaresborough clubs. There is also some day ticket fishing for trout and coarse fish on a stretch in Knaresborough known as the Lido.

Downstream of Knaresborough, little serious trout angling takes place, although the fishing is still generally classified as "mixed". Most of the fishing is controlled by large angling clubs based in Leeds, York, Harrogate and Bradford, whose main interest in the river is coarse/match angling. Some day ticket fishing is available, at Tockwith and Nun Monkton. The clubs have introduced a number of stock fish in recent years, chiefly juvenile chub and barbel, though roach and bream were introduced in the 1970's.

The majority of the fishing on the River Wharfe is controlled by angling clubs on a seasonal membership basis. However, many of these also make day permits available to the general angling public. The Bolton Abbey Estate controls a considerable length of the middle reaches of the river and provides fishing for trout and grayling on both season and day permits.

Match angling is concentrated in the lower reaches of the river between Otley and Ulleskelf. The lower river occasionally hosts some large events. However, this is not exclusively a match fishery and a lot of individual fishing still takes place.

Both catchments have a number of stillwater fisheries. Yorkshire Water Services Ltd allow angling on Beaverdyke and Ten Acre Reservoirs in the Nidd catchment and the Washburn Valley reservoirs of Fewston and Swinsty, all of which rely on put-and-take management. Disabled angling facilities are also provided on Swinsty Reservoir.

A wild brown trout fishery is run on Scar House Reservoir by the Nidderdale Angling Club and a private fly-fishing syndicate controls the trout and grayling fishery on Gouthwaite Reservoir. The fishing rights at Lindley Wood Reservoir are reserved by Farnley Hall Estate where the mixed fishing is let to a syndicate.

Smaller still waters within the two catchments also include some excellent coarse fisheries. For example, the gravel pits at Knotford Nook near Otley, and at Knaresborough, offer quality coarse fishing.

There are currently no commercial fishing activities within the catchment. In the past some exploitation of eel stocks was undertaken in the tidal reaches of the River Wharfe by fyke netsmen but changes in legislation now prevent this. However, eel stocks continue to be exploited by anglers in this section.

Future Situation

A large proportion of the fishing rights on both rivers is controlled by angling clubs with open membership and/or day ticket facilities, hence there is limited potential for further exploitation and it is envisaged that control of this resource will remain much as it is at present.

In view of the angling pressure on both rivers, brown trout and grayling stocks need to be carefully managed to ensure the quality of this type of fishing is maintained in the future.

The NRA will aim to work with the angling clubs on aspects of fishery management and in collaborative projects for improvement of the fishery habitat in the two rivers and their tributaries. It is also hoped that ways may be found to improve access and facilities for disabled anglers in both catchments.

On the assumption that water quality will be steadily improved in the Humber, salmon stocks may show an increase from the low background levels that currently exist in the Wharfe and to a lesser extent the Nidd. Improvements at weirs presently hindering the migration of fish species generally may assist the re-establishment of salmon.

RIVERS NIDD AND WHARFE CATCHMENT

MINERAL EXTRACTION AND MINING

MINERAL/MINE WORKINGS

1 COOLSCAR QUARRY
2 THRESHFIELD QUARRY
3 SWINDEN QUARRY
4 SKIPTON ROCK QUARRY
5 COLDSTONES QUARRY
6 BLUBBERHOUSES QUARRY
7 HIGHMOOR QUARRY
8 SMAWS QUARRY
9 JACKDAW CRAGG QUARRY
10 COPLEY LANE QUARRY

0 2 4 6 8 10km
SCALE

NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No.20

4.12 MINERAL EXTRACTION AND MINING

GENERAL

Mining and quarrying can affect the water environment due to the physical presence of a mine or quarry, dewatering or discharges from a site. Quarries can intercept runoff from surrounding areas thereby depriving surface water courses of water, or intercept groundwater flow which may feed springs or provide groundwater supplies through borehole abstractions. Dewatering at mines and quarries can affect groundwater flow which can then affect groundwater abstraction, springs and surface water courses by reducing inflow and lowering the water table. Discharges can have an impact on receiving waters due, for example, to the presence of elevated levels of suspended solids which can clog the bed of a stream creating a poor environment for flora and fauna.

Management Framework

The NRA is a statutory consultee on all planning applications for mining, quarrying and mineral extraction. As such the Authority will make comments on any proposals to ensure that the water environment is protected. Direct discussion with the operator is also an important part of the process especially on developments with a potentially large impact on the water environment. The responsibility for implementing conditions that are placed on planning agreements falls to the local planning authority.

LOCAL PERSPECTIVE

Current Situation

There are a number of quarries within the catchment, minerals worked including limestone and sand and gravel (see map 20).

There are 8 limestone quarries in the catchment and these extract either Magnesian Limestone or Carboniferous Limestone. The quarries are broadly in two special groups with one concentration in the west and one in the east of the catchment. This is a result of the underlying geology with the western quarries extracting Carboniferous Limestone which is confined to the west of the catchment, and eastern quarries extracting Magnesian Limestone which is limited to the east. Limestone hydrogeology can be complex and the impact of quarrying in such rock has to be carefully considered.

Swinden Quarry is a large scale quarry within the Yorkshire Dales National Park. Current planning permission for the site has no significant restoration proposals. To produce a better restoration of the site the operators have applied for planning permission to deepen the quarry by an additional 40m and restore the site as a lake and nature area. The additional deepening could, however, have a major impact on ground and surface water resources in the area.

The NRA has therefore been involved at an early stage and requested extensive investigation and long term monitoring prior to giving a full response. Consultants for the site operator are currently undertaking this work and have presented interim results which indicate the potential effects. These results indicate a minimal impact but presentation of the final report is awaited. The impact of the increased discharge produced mainly as a result of increased groundwater inflow have also been discussed and the operators have been made aware that the NRA will require a tightening of the existing discharge consent to protect the receiving watercourses from adverse effects of suspended solids.

Planning permission for the work at the quarry has recently been refused although it is likely that the operators will re-submit their application at some time. If this is so, the NRA will maintain its involvement at the site.

There are 2 sand and gravel quarries in the catchment extracting fluvio-glacial deposits.

Future Situation

The fate of the planning application for Swinden Quarry and the final report on the effect of the proposed deepening are awaited. If permission is granted, long term monitoring will be required and the NRA will be strongly involved in any such programme.

The NRA will, in general, maintain its involvement in any developments which will impact on the water environment. When considering any future proposals for quarrying in washland the NRA will seek assurances that at no stage, either during operation or following restoration, will there be a net loss in flood storage.

4.13 FLOOD DEFENCE

GENERAL

A major function of the NRA is to provide effective defence for people and property against flooding from rivers and sea, and the provision of land drainage to maintain soil conditions suitable for agriculture. Normally, flooding is a result of extreme climatic conditions, such as very heavy rainfall or snow melt often combined with high winds.

Management Framework

Under the Water Resources and Land Drainage Acts 1991 the NRA has a duty to oversee and has powers to control significantly obstructive works on watercourses. Internal Drainage Boards (IDBs), have similar powers for watercourses within their districts.

Within the catchments there are six IDBs as illustrated on map 21. Most of these were established under the Land Drainage Act 1930. They were set up to deal with specific drainage problems in relatively low lying agricultural areas and still carry out this work today.

The powers of the IDBs and the NRA are clearly defined by relevant legislation. Within an IDB area, the Board supervises all matters relating to land drainage. These powers do not extend to any 'Main River' within an IDB area.

Certain reaches of the river are formally designated as 'Main River' (see map 22). On Main River, the NRA has special powers to carry out works or control the actions of others. Any proposal that could interfere with the river bed or banks or obstruct the flow in the river requires the formal consent from the NRA.

LOCAL PERSPECTIVE

Current Situation

Maintenance and Operations

Maintenance programmes ensure that the flood defences are kept in good order. Regular maintenance is carried out on all structures owned by the NRA. All maintenance operations are carried out in ways that are sensitive to the environment with every opportunity taken to further conservation.

Some examples of recent changes to maintenance procedures which aim to benefit the environment whilst still meeting the requirements of flood defence are the change from poisoning to trapping of vermin, change in timing and frequency of bank mowing, greater use of natural materials for erosion protection and use of materials obtained from channel maintenance for conservation projects.

Flood Defences

No major urban flood defence works exist on the River Nidd. However, at Pateley Bridge there are some low level informal defences providing some protection. In addition Yorkshire Water's management of water levels in Gouthwaite Reservoir has been agreed by the NRA and includes provisions to reduce the peak flow and volume of floods on the River Nidd downstream of the reservoir. The River Nidd is extensively embanked along both banks from the A1 eastwards to its confluence with the River Ouse. This results in the whole of the river valley acting as a washland. The banks are not owned by the Authority but are maintained under permissive powers. All the flood defence systems are washlands which operate by overspill from the river.

There are extensive washlands on the Wharfe from Ilkley downstream. The major ones are at Pool and Newton Kyme with large controlled washlands from Tadcaster down to the Ouse confluence on both banks. The most significant of these are at Tadcaster and Ryther.

Downstream of Tadcaster, schemes have been undertaken either directly to protect property and land from flooding or to improve the function of washlands, thereby reducing flood risk elsewhere. At Ulleskelf there is a flood wall that is designed to protect 20 properties. There is a pumping station at Nun Appleton which controls levels in Fleet Drain. High water in this drain can cause flooding in Appleton Roebuck and Copmanthorpe. Additional schemes are at: Kirkby Wharfe, Bowlam Bank, Ryther, Button Hill, Cock Beck confluence, and Bolton Percy.

In Tadcaster there are riverside defences mainly comprising earth banks but with a short sheet piled section. Just downstream of Tadcaster there are sluices which control water levels on Cock Beck upstream to Stutton.

Although the River Wharfe is influenced by the tide as far upstream as Tadcaster weir the highest flood levels are dominated by the fluvial rather than tidal flows.

Future Situation

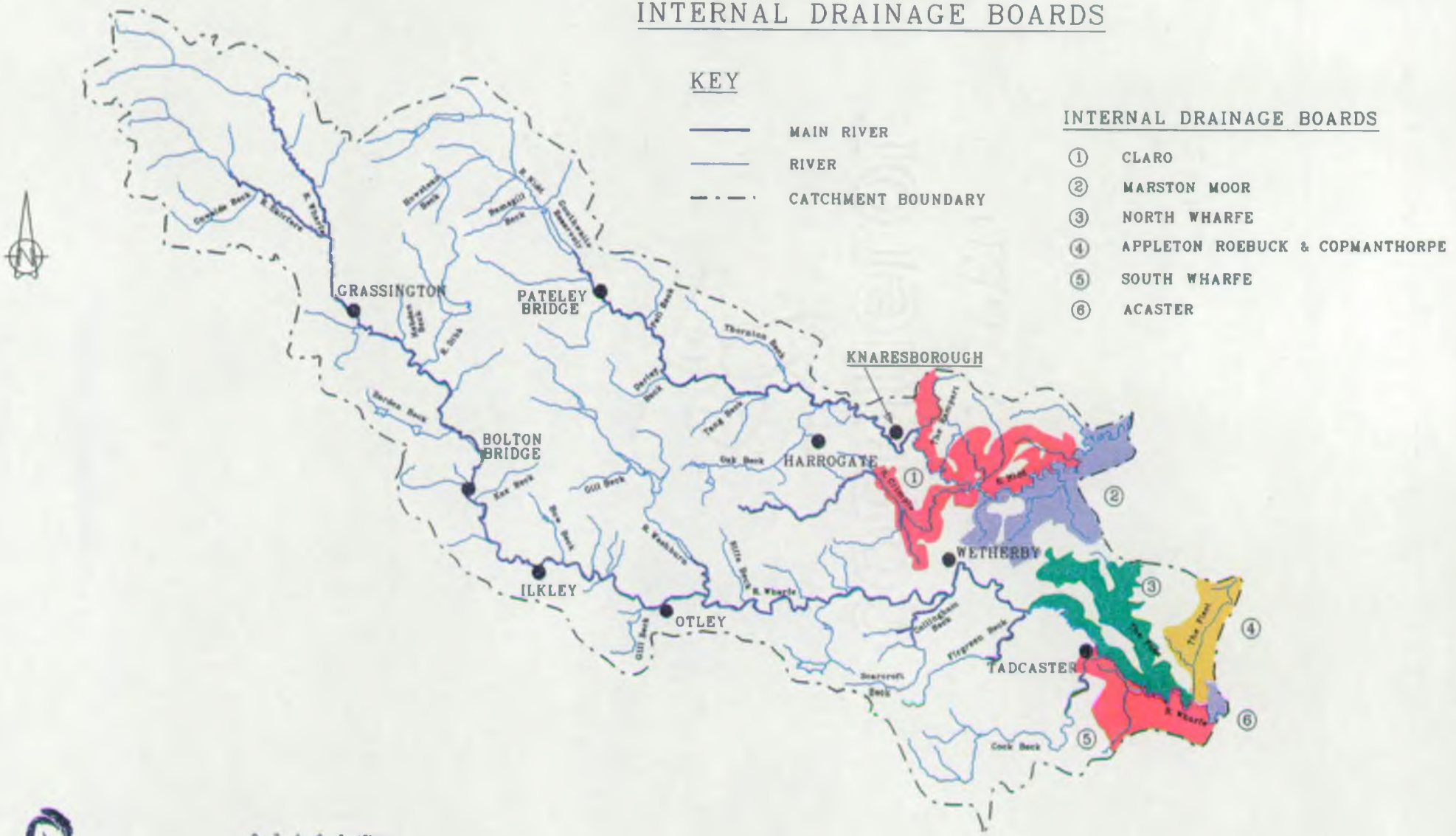
Maintenance and Operations

The NRA will investigate and record the condition of Flood Defence Assets with a view to preparing a priority based programme of repair, renewal and maintenance. In preparing the programme the NRA will consider the implications of doing nothing, and implementing the changes to current methods of operation.

Controlled washlands within the catchment will be investigated to determine whether or not they come within the scope of the 1975 Reservoirs Act. Where necessary, it is proposed to register washlands under the Act.

RIVERS NIDD AND WHARFE CATCHMENT

INTERNAL DRAINAGE BOARDS



NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No.21

RIVERS NIDD AND WHARFE CATCHMENT

MAIN RIVER & WASHLANDS

NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No.22

The speed of evacuation of washland areas following a flood will be investigated. Where necessary the provision of measures such as relief outfalls, to aid evacuation once the peak of the flood has passed, will be considered.

Flood Defences

The NRA will continue to plan for renewal of valuable flood defences in order to maintain the current standard of protection into the future.

The NRA will also continue to investigate further the possibility of providing protection to new areas and to improving the level of protection to areas already protected by NRA defences. Particular attention will be given to those areas where the indicative standards of service are not currently met. Whilst these standards of service are an indication as to where efforts should be concentrated, they do not represent an entitlement to protection or a minimum target level. Nor does it mean that flood defences will not be provided to areas still at risk from flooding even though the indicative standard of service is already achieved. Each particular case will be considered on its own merits.

Flood defence schemes will only be provided where it is cost effective and environmentally acceptable to do so. Proposed schemes are subject to rigorous examination to ensure that they not only meet the above criteria but also will be acceptable to the local population and that they will have no detrimental effect on other areas.

The following areas have been identified for further investigation into the provision of flood defences:

Otley
AddinghamBramham: Firgreen Beck
Collingham
Bolton Bridge
Pateley Bridge

A flood defence scheme for Ilkley has recently been considered by the NRA. However, due to the strength of public opposition there are now no current proposals to consider this scheme further.

4.14 FLOOD WARNING

GENERAL

The NRA's role during a flood event is to monitor fluvial and tidal conditions in the 'Main River', updating forecasts and issuing further statements as the situation worsens or improves. The emergency workforce are deployed to inspect and ensure the integrity of the flood defences and operate essential equipment.

During flooding events, the responsibility for providing assistance to the public lies with the District Councils. However, in exceptional circumstances, if resources permit, the NRA will assist if specifically requested to do so by the District Council.

Management Framework

Under the Water Resources Act 1991 the NRA has the powers to provide, operate and maintain flood warning systems. There is a national system of colour coded flood warning statements issued to the Police. Within this catchment the Authority also issues warnings to British Rail and Bradford Metropolitan District Council.

The ascending levels of warning statements, yellow, amber and red, indicate the anticipated severity of flooding. The Police are the prime recipients of these warnings and will implement regional and local emergency procedures involving the local authorities and other emergency services.

LOCAL PERSPECTIVE

Current Situation

The region uses a network of telemetry stations providing data on river levels and rainfall. These stations are used to monitor high levels on 'Main River' lengths and to alert staff to operational requirements.

The network is known as the Regional Telemetry System (RTS) and also serves the needs of other functions within the region. The RTS forms an integral part of the River Flow Forecasting System (RFFS) which will provide additional data for improving the prediction of flood events. RFFS enables flood forecasts to be produced at certain critical locations within the catchment (Forecast Points). In addition, the use of real time data will increase the accuracy of our forecasting.

The location of River Level Stations, Rainfall Stations and Forecast Points are shown on map 4.

The main centre of attention on the River Nidd, for Flood Warning purposes is Pateley Bridge. There are no formal defences in the town and Harrogate District Council attend to carry out emergency works in times of flood. When resources permit the Authority assists in these operations. Some properties are considered to be at risk from flooding in Knaresborough. Roads are at risk from flooding at Cattal and the A59 near Skip Bridge.

However, specific flood warnings are not currently issued due to the complex nature of the washlands and the strong influence of levels in the River Ouse in this area. No other operational work is carried out apart from inspection of flood banks and a general monitoring of the situation.

The only major urban flood defence works on the River Wharfe are at Tadcaster where the town is protected by an earth embankment and sheet piled walls. Downstream of Tadcaster to the confluence with the River Ouse there are defences as previously described in section 4.13. The emergency workforce inspects these defences to ensure they are performing satisfactorily. In particular inspections are undertaken of the defences at Ulleskelf and pumping stations and the various penstocks on the lower section of the river are operated to prevent flood water backing up drainage systems. Within the limits of NRA resources, assistance is given to the emergency services to alleviate actual flooding problems by sandbagging or small scale pumping operations.

In order to clarify requirements for flood warnings procedures and operational response, the NRA has recently adopted 'Emergency Response Levels of Service' as defined below.

For flood warning the target level of service is:

Where possible, to issue a warning at least two hours in advance of flooding in accordance with a nationally agreed and consistent procedure, identifying the river reach or coastal zone at risk, together with an indication of public safety aspects, property and land at risk and an assessment of certainty.

For operational response, the target level of service is:

To operate NRA installation and defences to design criteria, to formulate and maintain a plan for responding to flooding and the failure of NRA flood defence assets and to mobilise resources to attend flood incidents with a specified time depending on the location and potential consequences of the incident.

Within the catchments the proposed target levels of service described above are already met in most cases. Work has commenced on identifying those areas where changes are required in order to achieve the targets. However, it should be noted that the target of at least two hours notice for flood warnings may not be possible in some cases. Catchment characteristics might be such that flooding occurs within two hours and prior forecasting is not technically possible. In other cases, the cost of providing a forecast and warning service might not be justified. In some areas warnings of significantly more than two hours might be possible and in these cases warnings will be issued with a longer lead in time.

Future Situation

The NRA will continue to refine and improve the Flood Warning System and, where necessary, measures wil be investigated and feasible cost effective measures will be implemented to achieve the 'Emergency Response Levels of Service'. The emphasis will be to focus warnings to high risk areas and to define the extent of potential flooding. Localities protected by flood alleviation works, but at risk from an exceptional flood overtopping the defences, will also be incorporated into the flood warning procedures.

The NRA has recently considered the possibility of extending the existing flood warning service provided to include the following locations:

Bolton Bridge, Addingham, Ilkley, Burley, Otley, Pool, Collingham and Wetherby.

Draft flood warnings are now available and will be incorporated fully into the flood warning procedures.

The possibility of extending flood warning procedures to include those properties in Knaresborough at risk from flooding will be investigated and any new flood warnings implemented as appropriate.

Consideration will be given to extending the number of forecast points within RFFS in order to assist in the prediction of flood levels for critical locations. Initially the provision of a forecasting point at Knaresborough will be considered.

4.15 FUTURE DEVELOPMENT

GENERAL

The broad objective of catchment management planning is to conserve and enhance the total river environment through effective land and resource management. While the NRA is well placed to influence some of the factors responsible for the functioning of the hydrological system, particularly in relation to the river corridor itself, it has, however, very little control over the mechanisms which determine land use change on a catchment-wide basis. This is largely the responsibility of the local planning authorities through the implementation of the Town and Country Planning Acts.

The NRA's participation in the planning process is essentially at two levels, to input into the production of strategic plans and to comment on specific development proposals. The NRA is keen to develop understandings and working relationships with local planning authorities (LPAs) and developers. Future residential, commercial and industrial development is identified in County Structure Plans, District Local Plans and Unitary Development Plans. These plans identify policies against which the planning authorities consider development proposals and define land-uses.

Management Framework

In addition to being a statutory consultee in the preparation of Development Plans, the NRA is such a consultee for the purposes of categories of development specified in Article 18 of the Town and Country Planning General Development Order 1988. Local planning authorities will also "informally" consult the NRA on other development applications and on agreed areas and types of development. The final decision, however, on planning matters rests with the planning authority.

Parallel to the development control process, the NRA performs a regulatory role determined by the provisions of Land Drainage Act 1991, Water Resources Act 1991 and Byelaws made thereunder.

The NRA's purpose in participating in the planning process is to protect the public and the environment from any adverse effects associated with development in relation to surface water and groundwater. The NRA will, therefore, oppose any specific development that conflicts with this purpose and will seek to persuade the local authorities to adopt policies for protecting both the public and the environment. In providing advice to planning authorities the NRA will encompass all proposals which may affect the water environment.

LOCAL PERSPECTIVE

Current Situation

Through its Planning Liaison Section the NRA has a full and active dialogue with all the local planning authorities in the Nidd and Wharfe catchment at all levels of development control (see map 23). This extends from making comments on individual applications to providing guidance notes on policy inputs to structure plans. (Refer to appendix for details on the progress of local planning authorities in the preparation of their district wide plans at the time of the CMP preparation).

Developers are required to provide facilities to minimise pollution risk and any new discharges to controlled waters require the specific consent of the NRA. Conditions are imposed on new discharges to ensure that river quality objectives are achieved.

The NRA's powers for controlling development are limited to works directly affecting watercourses and main river floodplains. The NRA does, however, work closely with local authorities within the catchments in order to prevent development which could endanger life, damage property or lead to wasteful expenditure of public resources on remedial works, the NRA will oppose any new developments that will flood or cause flooding or cause damage to flood defences. To assist in this process the Department of the Environment has published Circular 30/92 entitled Development and Flood Risk.

In the circular the Government has identified surveys carried out under Section 105(2) of the Water Resources Act 1991 as the NRA's main input into strategic plans. To enable us to fulfil our obligations the NRA has agreed a Memorandum of Understanding with the representative associations of the local authorities. The Memorandum is a framework for local detailed discussions. Its purpose is to target the flood defence surveys to provide information where the local planning authorities need it. We will do this by agreeing a programme of work with the local planning authorities that will include location, information required and timescale.

This major initiative was launched in the Region in March 1994 when presentations were made to all planning authorities in the Region. The preparation of the survey programme in conjunction with the local planning authorities will continue through the summer.

In addition to the advice provided to planning authorities the NRA has its own powers to control development in, over or under main rivers and within specified distances from the bank tops of main rivers to provide for maintenance works. The NRA can also control any works which could affect the flows in an ordinary watercourse. In considering such proposals the NRA will take into account conservation and the protection of fisheries and will refuse consent or object to the granting of planning permission on these grounds.

RIVERS NIDD AND WHARFE CATCHMENT
ADMINISTRATIVE BOUNDARIES

NRA
National Rivers Authority
Northumbria & Yorkshire Region

MAP No.23

Future Situation

The crucial role of Planning Authorities in determining development of the built and rural environment and its subsequent impact of the water environment cannot be overstated.

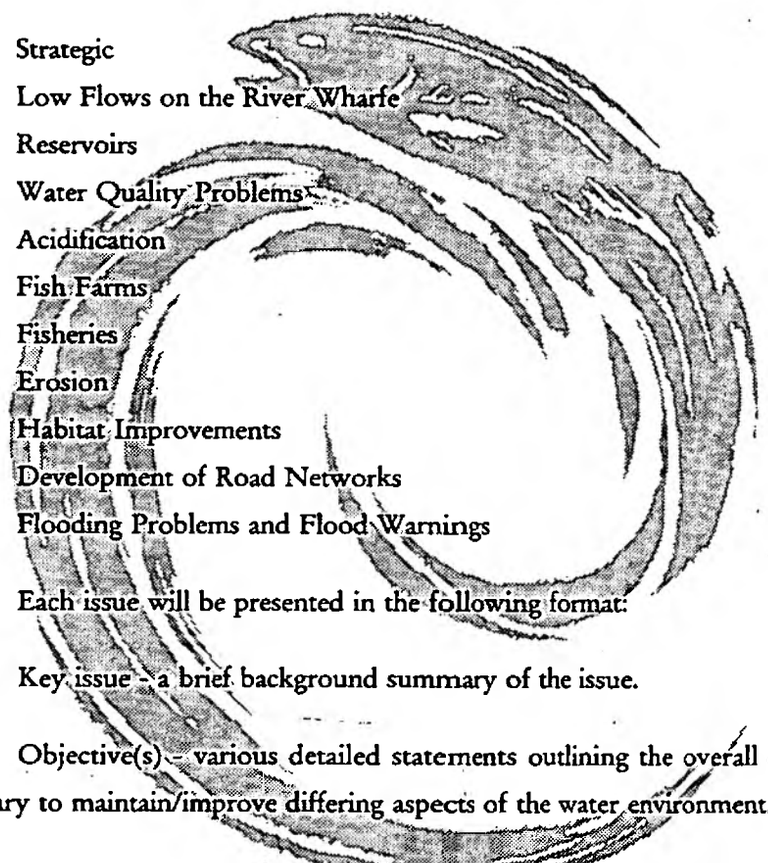
The local planning authorities are responsible for the determination of land use changes and promoting forward planning policies. As a statutory consultee the NRA provides local planning authorities with guidance statements to assist them in formulating policies for inclusion in their plans which reflect the NRA's concerns and responsibilities including the statutory requirement to conserve and enhance the water environment and associated lands. Addressing water issues will assist the formulation of settlement strategies, the location, attractiveness and sustainability of developments. It will also improve the quality of policies for landscape, nature and urban conservation, recreation and tourism. Plans sensitive to water matters will be protecting and enhancing a vital natural resource and the surrounding environment.

Continued consistent involvement of the NRA in the production of local strategic and national plans is vital to the well-being of the water environment. Production of catchment management plans outlining the NRA's vision for sustainable development are seen as important documents to maintain and promote close liaison with all development bodies.

5.0 CATCHMENT ISSUES

Throughout the preparation of this Consultation Report a number of issues have been identified which require consideration by all those interested in the future of the catchment.

Issues to be addressed as follows:



Strategic
Low Flows on the River Wharfe
Reservoirs
Water Quality Problems
Acidification
Fish Farms
Fisheries
Erosion
Habitat Improvements
Development of Road Networks
Flooding Problems and Flood Warnings

Each issue will be presented in the following format:

Key issue - a brief background summary of the issue.

Objective(s) - various detailed statements outlining the overall objective necessary to maintain/improve differing aspects of the water environment.

Proposals - options which could be developed to address the detailed objectives.

Details action plans, involving costs and timetables will only be established after the consultation phase.

Each issue must not be viewed in isolation however, since they all contribute towards a single vision - the future environmental well-being of the Nidd and Wharfe catchment - and are therefore fundamentally inter-related.

ISSUE 5.1 STRATEGIC

Certain issues identified throughout the preparation of this catchment management plan were of a strategic nature covering all areas of the catchment these include water resources management, pollution prevention, ecology and recreation, and flood defence issues as detailed below.

Surface Water Abstraction

Objective: Determine and assess the environmental impact of future river abstractions and plan to protect minimum flows through control of abstraction where ever possible and practical.

Proposals:

- Investigations are currently being carried out by consultants for the NRA both nationally and regionally, to determine the scale of future demands for river abstractions and their environmental impacts.
- Monitor the water usage within the supply zones of Leeds and Bradford to ensure the water undertakers are meeting their requirements set out by OFWAT and the DoE, as water supply to these zones comes partly from the catchment.
- Review existing policies for the determination of groundwater and surface water abstraction licences and, where necessary, adopt revised methodology for determination.
- Assess minimum river flows at all measuring sites to ensure the base flow of the river can be protected.

Aquifer Protection

Objective: Prevention of pollution of groundwater.

Proposals:

- Implement the NRA Groundwater Protection Policy through staff training and promotion of the guidelines to Planning Authorities, landowners and dischargers within the catchment.
- Delineate groundwater protection zones for the major groundwater sources.

Pollution Prevention

Objective: Maintain and improve water quality in the Nidd and Wharfe catchment by effective pollution prevention measures.

Proposals:

- Undertake investigations and recommend pollution prevention measures on trade premises.
- Continue to visit farms in selected areas on a priority basis to recommend pollution prevention improvements and where necessary to ensure that the appropriate work is carried out.
- Ensure Yorkshire Water Services (YWS) Ltd continues its programme of improvements to discharges from combined sewer overflows and public surface water sewers.
- Continue to investigate the failure of package sewage treatment works to achieve satisfactory performance on commercial premises.

Ecology, Recreation And Amenity

Objective: Protect existing wildlife and their habitats under the existing legislation.

Proposals:

- Continue to follow up the work of the Otters and Rivers Project to identify and encourage appropriate habitat management for otters.
- Encourage the return of Otters to the catchment through collaboration with outside organisations and education of landowners and the public.
- Maintain and increase habitat diversity to protect and enhance flora and fauna working with English Nature, Yorkshire Wildlife Trust, local authorities and other interested organisations.

Objective: Protect, maintain and increase areas of conservation value within the catchment in conjunction with other agencies and to link conservation sites in accordance with Article 10 of the Habitats Directive.

Proposals:

- Encourage links between sites of high conservation interest in accordance with Article 10 of the Habitats Directive.
- Encourage and promote the Countryside Stewardship Scheme for land owners and continue links with the Farming and Wildlife Advisory Group, National Farmers Union and Country Landowners Association.

- Promote the establishment of buffer zones through the MAFF Set Aside Scheme and the newly proposed MAFF Agri-Habitat Scheme.
- Work with the Forestry Authority to encourage the creation of new woodlands and the good management of existing areas through available grant schemes where appropriate.
- Support the aims of the Nidderdale Area of Outstanding Natural Beauty (AONB) in protecting the landscape and thus enhancing the ecological status of the area.

Objective: Maintain and improve ecological water quality within the catchment.

Proposals:

- Respond reactively to requests to analyse waters for blue green algae and advise and inform the relevant authorities.
- Examine, through collaboration with other organisations, the effect of land management changes in the upper catchment on stream sedimentation and ecology.
- Work in collaboration with Environmental Protection to identify pollution discharges and take remedial action where appropriate.

Objective: Protect native crayfish populations.

Proposals:

- Assess the extent of populations of the native white-clawed crayfish in the catchment.
- Monitor the spread and impact of American signal crayfish in the Wharfe, especially in White Beck.
- Contribute to and support proposals for an exclusion zone under the Habitats Directive delineating an area where it would be harmful to introduce American signal crayfish.
- Continue to monitor and take measures to protect the populations of native crayfish.

Objective: Promote and further recreation wherever it will not have a detrimental impact on the water environment.

Proposals:

- Encourage and promote improvements to access to the river.
- Investigate the potential for collaborative projects with other organisations in rural and suburban areas to improve access to river corridors.

Objective: Improve facilities for people with disabilities.

Proposal:

- Investigate the potential for collaborative projects to improve access and facilities for people with disabilities.

Archaeology

Objective: Protect areas of archaeological and heritage interest.

Proposals:

- Develop a database on heritage and archaeological sites through liaison with the relevant organisations.
- Work with other organisations to protect the integrity of heritage features in both catchments.

Flood Defence

Objective: Provide and maintain flood defences.

Proposals:

- Investigate and record the condition of Flood Defence Assets and prepare a priority based programme of repair, renewal and maintenance. In preparing the programme the NRA will consider the implications of 'doing nothing' and implementing changes to current methods of operation.
- Investigate controlled washlands within the catchment and register those washlands which come within the scope of the 1975 Reservoirs Act.
- Investigate the provision of additional relief outfalls to evacuate washlands as soon as possible after the flood has subsided.

Objective: Improve efficiency and effectiveness of the NRA's emergency response.

Proposals:

- Investigate and record the condition of all existing flood defence structures within the catchment.
- Modify where economically and practically possible flood defence structures to enable remote operation utilising the Regional Telemetry System.
- Consider replacing structures which cannot be readily adapted for remote operation.
- Investigate the feasibility of providing closed circuit TV at critical flood defence structures.

Objective: ***Continue to refine and improve the Flood Warnings System through incorporation of the Regional Telemetry System and the River Flow Forecasting System.***

Proposal:

- Continue to liaise with the Police and Local Authorities to ensure that procedures are in place to respond to NRA warnings. Ensure the provision of a timely, reliable and accurate Flood Warning Service to the public in areas at risk covered by the scheme.

Future Development

Objective: ***Fully participate in the Local Authority planning process to ensure protection of the water environment.***

Proposals:

- Participate fully in the development control process and where necessary oppose any proposals that will damage the water environment.
- Participate fully in the strategic planning process and provide guidance to local councils on methods of protecting the water environment through their development plans.
- Ensure that NRA interests are not adversely affected by future mineral extraction in the Wharfe Valley.

Objective: ***Ensure that the NRA's catchment management plan is adopted as a strategy for the future management of the water environment of the Nidd and Wharfe catchment.***

Proposals:

- Produce the Nidd and Wharfe Catchment Management Plan following three months external consultation.
- Positively promote the concept of catchment management planning.
- Monitor and review the CMP annually.

ISSUE 5.2 LOW FLOWS ON THE RIVER WHARFE

Two sites on the River Wharfe at Otley and Pool-in-Wharfedale have been identified as being in the national top 40 for low flow alleviation. Low flows can result in insufficient dilution for effluents resulting in poor water quality, disruption of fish migration and affects on flora and fauna in and around the river. The NRA will aim to alleviate low flows where they have been identified and give priority to those detailed in the national low flow programme.

Objective: Alleviate low flow problems in the River Wharfe at Otley and Pool.

Proposal:

- Examine current abstraction licences and in consultation with licence holders discuss possible alterations to the abstraction regime to obtain minimum flows over Pool and Otley weirs for the benefit of the river environment.

ISSUE 5.3 RESERVOIRS

The Nidd and Wharfe catchment has several large reservoirs near the head of the rivers for public water supply. Compensation releases from these reservoirs are now critical as these provide a significant proportion of the summer flow in the river. This water maintains the river ecosystem providing dilution for sewage effluent and enabling other abstractions to take place.

Gouthwaite

Objective: Obtain improved compensation releases from Gouthwaite Reservoir.

Proposals:

- Investigate modification of operating rules.
- Examine siltation in the reservoir.
- Examine compensation releases from Gouthwaite Reservoir in relation to low flows and the effects of STW's in order to maintain river quality.
- Contribute ecological data to evaluate proposals for limited desilting of Gouthwaite Reservoir which aims to minimise any reduction in reservoir storage capacity.
- Ensure that any changes to the management agreement for Gouthwaite Reservoir protect flood defence and ecological interests.

Objective: Limit the impact of any future transfers of water out of the catchment on the river ecology.

Proposal:

- Ensure that any proposals for the additional transfer of water out of the catchment are subject to full assessment of their impact on river ecology.

Grimwith

Objective: Manage the introduced stock of arctic charr in Grimwith Reservoir to maintain its conservation value.

Proposal:

- Develop and implement a management strategy in conjunction with YWS Ltd for arctic charr in Grimwith Reservoir.

Objective: ***Minimise the ecological effect of compensation releases from reservoirs to the water environment.***

Proposals:

- Assess the effects of compensation releases from Grimwith Reservoir on flow regimes and temperature in the River Wharfe and their consequent impact on fish populations and angling activity.
- Negotiate with YWS Ltd to set minimum compensation releases from Grimwith Reservoir and the Barden Reservoirs to protect fish populations in the receiving watercourses.

Washburn Valley

Objective: ***Minimise the impact of intermittent releases from the Washburn Valley Reservoirs on the water environment.***

Proposals:

- Investigate with YWS Ltd methods of reducing the environmental impact of intermittent releases from Thruscross Reservoir.
- Investigate with YWS Ltd the impact of compensation flows from Lindley Wood Reservoir on the lower Washburn.

Objective: ***Maintain RQO of the River Washburn and its tributaries to protect its use as a potable supply catchment.***

Proposals:

- Continue to maintain pressure for improvements at farms identified as presenting a risk of pollution.
- Maintain close liaison with YWS Ltd to identify other sites which represent a potential risk.
- Continue to monitor the quality of the river and main feeder streams in conjunction with YWS Ltd.
- Respond rapidly to any incident that is likely to endanger the security of supply, and closely liaise with YWS Ltd in the event of such an incident.
- Maintain stringent controls on development in the catchment, particularly as the rate of refurbishment of redundant buildings has accelerated with the release of numerous derelict properties by YWS Ltd.
- Employ prohibition notices on new developments stipulating that in each case the appropriate means of sewage treatment and disposal is agreed with the NRA.

ISSUE 5.4 WATER QUALITY PROBLEMS

Over the past few decades the Nidd and Wharfe catchment has been subject to diverse and sometimes intense urban, rural, industrial and agricultural development. As a result, both water use and nutrient rich waste discharges have increased. Of particular concern in heavily populated areas is the discharge of large volumes of sewage effluent from poorly performing sewage treatment works leading to downgrading of stretches of the river. Improvement of water quality to the stipulated objective is therefore a fundamental issue within the catchment.

Objective: Ensure replacement of the Glasshouses STW by the earliest possible date to secure the RQO of the Nidd below the works.

Proposal:

- Seek to ensure that YWS Ltd progress the proposed scheme for replacement of Glasshouses STW within the projected timescale of 1995.

Objective: Investigate intermittent elevated ammonia and solids levels in the upper Nidd which are coincident with high flow conditions.

Proposal:

- Undertake a survey of the river and its tributaries using chemical and ecological techniques during predetermined weather conditions to identify the source or sources of the contamination.

Objective: Achieve RQO in Coppice Beck and Oak Beck below Harrogate.

Proposals:

- Continue a programme of monitoring the effects of the combined sewer overflows (CSO's) and sewer cross connections on the watercourse.
- Ensure YWS Ltd and the local authority carry out investigative work to identify the problem CSO's and contaminated surface water drains and to schedule improvement works accordingly.
- Finalise the drainage area plan, with the aim of prioritising problem CSO's for subsequent improvement.

Objective: Achieve RQO in the Nidd between Harrogate and Fleet Beck.

Proposals:

- Achieve RQO in Coppice Beck and Oak Beck.
- Maintain pressure on YWS Ltd to improve effluent quality from Harrogate North STW.

Objective: Achieve RQO in River Crimple below Harrogate South STW.

Proposals:

- Maintain pressure on YWS Ltd to improve effluent quality from Harrogate South STW.
- Ensure YWS Ltd and the local authority carry out investigative work to identify problem CSO's and contaminated surface water drains discharging to the Crimple or its tributaries and to schedule improvements following criteria laid down in AMP2.

Objective: Achieve Class 2 water quality in Fleet Beck downstream of Tockwith Industrial Estate.

Proposals:

- Ensure local companies provide an acceptable means of sewage treatment and disposal for the whole site.
- Limit development of this and similar sites through planning controls and/or the use of prohibitions unless adequate sewage treatment is available.

Objective: Maintain the RQO of the upper Wharfe particularly in summer, when tourism places the greatest demand on sewage treatment installations whilst river flows are at their lowest. At such times, short term overloading of some minor works can occur.

Proposal:

- Closely monitor performance of community and private sewage treatment works and continue to review consents to discharge where necessary to ensure river quality is maintained.

Objective: Maintain RQO downstream of Bolton Bridge to protect potable abstractions at Lobwood and The Hollins.

Proposal:

- Respond rapidly to any incident that is likely to endanger the security of supply, and liaise closely with YWS Ltd in the event of such an incident.

Objective: ***Achieve RQO in Sun Lane Beck below the disused municipal waste disposal site abandoned some 25 years ago.***

Proposals:

- Successful discussions with the local authority have resulted in a remediation scheme being proposed. The NRA will continue to ensure that the scheme is progressed to a satisfactory conclusion and the RQO for the watercourse achieved.
- Monitor and assess the recovery of biological communities following the implementation of the remedial scheme in Sun Lane Beck.

Objective: ***Determine the reason for disparity in chemical and biological classifications in Weeton Beck.***

Proposal:

- Undertake a biological investigation to determine cause of current poor quality.

Objective: ***Investigate the cause of downgrading of the Wharfe below Wetherby from Class 1A to 1B.***

Proposals:

- Model the river stretch to determine the predicted quality.
- Monitor the discharges from Newton Kyme village and Thorp Arch industrial estate to measure their effect on the river.

Objective: ***Achieve Class 2 water quality in St Helens Dyke below Thorp Arch industrial estate.***

Proposal:

- Develop a strategy to address the problems of contaminated drainage originating from this large industrial estate.

Objective: ***Achieve Class 2 water quality in the dykes at Newton Kyme which are affected by domestic sewage discharges.***

Proposal:

- Continue to maintain pressure on the residents of the village to provide satisfactory sewage treatment for properties that currently discharge untreated sewage to the watercourse.

Objective: Achieve RQO in the upper reaches of Cock Beck.

Proposals:

- Investigate the impact of CSO's, surface water discharges and Barwick STW. Prioritise the works which will provide the most effective means of achieving RQO.
- Carry out a catchment survey using chemical and biological techniques to identify the persistent cause of these failures so that appropriate action can be taken.

Objective: Maintain and improve ecological water quality within the Nidd and Wharfe catchment.

Proposals:

- Monitor and assess the impact of effluents discharged from the breweries in the Tadcaster area on ecological water quality.
- Investigate the causes of poor biological quality as well as fluctuations in quality in tributaries of the Wharfe, in particular, Baffle Beck, Collingham Beck and Riffa Beck.
- Monitor and assess the recovery of biological communities following removal or improvement in quality of polluting discharges into watercourses such as Town Beck.
- Continue monitoring the effect of discharges from Pool Paper Mill on the biological quality of the River Wharfe.

ISSUE 5.5 ACIDIFICATION

Upland streams in Britain are a resource of great economic and conservation value providing spawning sites for salmonids, water for public supply and supporting characteristic flora and fauna. In areas subject of high levels of acidic deposition these sensitive ecological systems are at risk through surface water acidification. It is important that watercourses are identified as being acidic so that remedial action can be taken where this is due to human influences.

Objective: ***Investigate acidification in the upper tributaries of the Nidd and localised areas of the Wharfe.***

Proposals:

- Assess the extent and impact of acidification on the ecology of the upper tributaries of the Nidd especially Ashfoldside Beck and their interaction with former metal mining activities.
- Investigate and assess the practicalities of possible remedial measures.
- Link local investigations with current NRA sponsored research on acidification in Yorkshire streams and rivers being undertaken at Huddersfield University.
- Limit activities which may accelerate acidification through input into the planning process.

ISSUE 5.6 FISH FARMS

High quality rivers have historically been subject to development for fish farm purposes. Fish farming has expanded rapidly to meet growing demand and in many instances has led to problems, such as the accumulation of organic silts, increased nutrient loading, increased ammonia levels and the escape of non-native fish.

Objective: ***Minimise the impact of fish farms on the ecology of the catchment.***

Proposals:

- Monitor the impact of trout farms on the ecology of the rivers Nidd and Wharfe in particular those at Low Laithes and Glasshouses on the Nidd.
- Undertake biological surveys to assess the effect of fish farm abstractions and discharges on the receiving watercourses.
- Implement measures to eliminate the escape of fish from farms through liaison with fish farm owners.
- Regularly monitor fish farm structures and management practices.
- Establish closer working links with MAFF in connection with the licensing of fish farms.
- Through planning procedures and NRA consents ensure that new farms are not established at inappropriate locations.

Objective: ***Investigate the impact of Kilnsey Park Fish Farm on the water quality of White Beck.***

Proposal:

- Continue chemical and biological monitoring of the effluent and watercourse to assess the impact and if necessary review the consent to reflect the downstream quality required.

Objective: ***Maintain the RQO of Hebden Beck downstream of Yorkshire Salmon Fish Farm.***

Proposal:

- Closely monitor the fish farm effluent particularly at peak loads and assess the effects of these in the light of the revised consent and the downstream water quality.

Objective: ***Achieve RQO downstream of the Washburn Valley Trout Farm.***

Proposals:

- Monitor the performance of the farm against the recently revised consent.
- Maintain pressure on the company to undertake further works until consistent consent compliance is achieved.

ISSUE 5.7 FISHERIES

Both rivers supports high quality trout and coarse fisheries which reflect the general good water and diverse physical habitats within the catchment. To maintain and improve these fisheries, the NRA will develop management strategies for trout, grayling, coarse fish and, as water quality in the Ouse and Humber improves, salmon. Through these strategies the NRA aims to move towards the development of self sustained natural stocks.

Objective: Produce a strategy for the re-establishment of salmon in the River Wharfe.

Proposals:

- Investigate measures to ensure unhindered passage of smolts and adult salmon between Linton Falls and the River Ouse.
- Encourage the establishment of stock genetically adapted to the river by eliminating introductions of stock from other rivers.
- Introduce a monitoring programme as a basis of informed management.

Objective: Monitor and develop appropriate management procedures for brown trout fisheries in the Nidd and Wharfe.

Proposals:

- Use genetic methods to test isolated stocks for genetic integrity.
- Conserve important genotypes of trout.
- Promote the development of self sustaining stocks and reduce the requirement for stocking by encouraging angling management to move away from put and take and towards catch and release management.
- Protect and improve the spawning and nursery areas to increase natural recruitment.
- Encourage the management of the upper Wharfe as a brown trout fishery, retaining Linton Falls as the upstream limit of salmon populations.

Objective: Investigate the decline in grayling stocks in the River Wharfe.

Proposals:

- Monitor existing stocks of grayling at Bolton Abbey estate and provide advice to improve stocks.
- Establish whether there has been a decline in grayling stocks at other locations in the catchment and identify the causes.
- Implement or encourage measures to reverse identified declines.

Objective: Develop a strategy relating to the upstream spread of coarse fish into salmonid waters in the Wharfe.

Proposals:

- Monitor the upstream spread of coarse fish into salmonid waters.
- Develop a strategy for the management of mixed fisheries.

Objective: Improve fish passage over weirs.

Proposals:

- Assess the arrangements for fish passage at all weirs, especially Birstwith, Cowthorpe and Knaresborough on the Nidd and Boston Spa and Burley on the Wharfe and negotiate improvements where necessary.
- Evaluate measures to improve passage of fish over Skip Bridge Gauging Weir on the Nidd.
- Refurbish the fish pass at Flintmill Weir on the Wharfe.
- Negotiate with paper mill owners for the installation of fish passes at Otley and Pool weirs.

Objective: Protect and improve the quality of the fishery habitats within the catchment.

Proposal:

- Undertake collaborative projects with angling clubs to improve the fishery habitat of the river and its tributaries.

Objective: Minimise the impact of river abstractions on the fishery of the River Wharfe.

Proposals:

- Assess the extent of entrainment of fish at Lobwood, Arthington and other river intakes.
- Take measures, through liaison with mill owners, to ensure that fish, including smolts, are not entrained at paper mill intakes.
- Investigate the effects of the abstractions at Lobwood and Arthington on flow regimes and temperature in the River Wharfe and their subsequent impact on fish populations and angling activity.

Objective: ***Assess the potential for restoration of the fisheries in tributaries in the Harrogate and Knaresborough area suffering from the effect of combined sewer overflows.***

Proposal:

- Use ecological techniques to assess the success of improvements to the existing CSO systems in terms of improving water chemistry, invertebrate and fish life.

Objective: ***Investigate habitat diversity, fishery and biological quality in the Buckden/Kettlewell area as a result of past maintenance works.***

Proposals:

- Evaluate both active and passive methods to restore the habitat and take remedial action where possible.
- Monitor fish stocks in this length to assess speed and extent of recovery.

ISSUE 5.8 EROSION

Erosion and the related problem of tipping are causing serious damage to river banks and adjacent land within the catchment, especially on the River Wharfe. This can cause problems for conservation, fisheries and recreational facilities such as footpaths. Maintenance of river banks is the responsibility of the riparian owner. The NRA is only able to undertake works to prevent erosion where the Authorities interests may be at risk.

Objective: ***Investigate the problems of bankside erosion and provide advice to landowners on appropriate erosion control measures in order to protect and enhance the water environment.***

Proposals:

- Evaluate the options to resolve problems of erosion.
- Provide advice to land owners on alternatives to tipping, riverine processes and the legal requirements for work in rivers. This would be undertaken by the promotion of erosion control measures which are appropriate to the landscape and its uses. Appropriate measures may include soft landscaping, buffer zones and restricting livestock access by fencing around sensitive wetland features.
- Assess the feasibility of erosion protection works at Ilkley groynes.
- Undertake a study to investigate the problem of erosion in Upper Wharfedale with the Yorkshire Dales National Park.

ISSUE 5.9 HABITAT IMPROVEMENTS

The majority of the catchment is of good or high ecological value especially the upper catchment within the National Park and AONB. The NRA intends to focus on those river stretches where ecological benefits can be achieved by carrying out physical improvements to the habitats and through collaborative projects with other organisations. This will be primarily concentrated in the lower catchment.

Objective: ***Improve river environment in the lower reaches of the Nidd downstream of Tockwith.***

Proposals:

- Instigate further tree planting and encourage sensitive farming practices wherever possible.
- Investigate the feasibility of installing small instream structures such as groynes to provide a more varied habitat for the benefit of fish life.

Objective: ***Protect, maintain and increase areas of conservation value within the catchment in conjunction with other agencies.***

Proposals:

- Work in partnership with North Yorkshire County Council, Harrogate Borough Council and other parties on an initiative for landscape/wildlife conservation in priority areas already identified in Harrogate District.
- Work in partnership with the Hawk and Owl Trust, Harrogate Borough Council and others to improve habitats for barn owls in the Harrogate area.

ISSUE 5.10 DEVELOPMENT OF ROAD NETWORKS

Within the catchment there are several nationally strategic and many locally strategic road developments either under construction or in planning. In the past the disposal of drainage from roads has placed an increasing burden on the aquatic environment, affecting the risks of both flooding and pollution. Roads provide large areas of impermeable surface draining rapidly to a single point and can often also act as barriers to flood flows or result in a loss of flood storage.

The NRA is concerned with ensuring that in the future new road developments are planned and constructed in a manner which will minimise the impact on the aquatic environment.

Objective: ***Ensure that there is no risk of flooding, or damage caused to habitats, flora, fauna and fisheries when determining proposals to culvert, divert, or alter a watercourse and its banks or change the use of flood plain associated with road improvement works within the catchment.***

Proposals:

- Provide ecological advice to help ensure the proper balancing of surface water flows from new road developments, through the NRA's input into the planning process.
- Ensure that NRA interests are not adversely affected by the A1 widening which involves crossing the River Wharfe, the River Nidd, Cock Beck and Bramham Beck.
- Monitor the ecological effects of increased suspended solids in the water system as a result of the A1 widening scheme within the catchment.
- Ensure through the planning process that the proposed A1 M1 link road has a limited impact on Cock Beck.
- Ensure that NRA interests are not adversely affected by the proposed Harrogate Bypass.
- Monitor the ecological effects of the construction of the Harrogate ring road on the River Nidd and tributaries.
- Provide ecological advice to help minimise the impact of the north and west sections of the Harrogate ring road on the River Nidd, Oak Beck and other tributaries.
- Ensure that NRA interests are not adversely affected by the proposed Spofforth Bypass.
- Ensure through the planning process that the proposed Ilkley Bypass is routed and constructed so as to minimise damage to the River Wharfe and its tributaries.

- Monitor the construction of the Burley-in-Wharfedale Bypass and Manor Park Bends improvements to check compliance with the Consents to Works in Rivers issued under the Water Resources and Land Drainage Acts 1991.
- Ensure that flood defence interests are not adversely affected by the DoT road schemes at Burley-in-Wharfedale. Investigate the possibility of contributing to DoT compensatory storage works with a view to reducing flood levels at Otley.
- Monitor fish stocks before and after the diversion of the River Wharfe for the construction of the Burley Bypass.
- Ensure all construction works on the A65 are closely monitored where there is a known risk of pollution by oil and solid material during construction. Any high risk work to be carried out only after close liaison with the NRA and following guidance.
- Monitor the effect of the construction of the new Bolton Bridge over the River Wharfe and its tributary Hambleton Beck on the water environment.
- Assess ways of restoring habitats and fish populations in Pace Gate Beck, previously damaged by A59 construction works.

ISSUE 5.11 FLOODING PROBLEMS AND FLOOD WARNINGS

There are a number of areas within the catchment at risk from flooding from 'Main Rivers'. Where particular problems have been identified the Authority aims wherever possible to provide economically and environmentally acceptable flood defences and also provide a timely and effective flood warning system.

Objective: Provide and maintain flood defences.

Proposals:

- Investigate the feasibility of providing an economically and environmentally acceptable flood protection scheme at Pateley Bridge.
- Investigate the feasibility of providing an economically and environmentally acceptable flood protection scheme at the following:

  Bolton Bridge, Otley, Addingham, Firgreen Beck, Bramham, Collingham

Objective: Continue to refine and improve the flood warnings system through incorporation of the Regional Telemetry System and the River Flow Forecasting System.

Proposals:

- Consider the possibility of preparing flood warnings for Knaresborough and implement as appropriate.
- Consider the provision of a forecast point at Knaresborough.
- Fully implement into the formal flood warning procedures additional flood warnings for areas at risk including the following:

  Bolton Bridge, Addingham, Ilkley, Burley, Otley, Pool, Collingham, Wetherby

OBJECTIVE	PROPOSALS
ISSUE 5.1: STRATEGIC	
Surface Water Abstraction	
Determine and assess the environmental impact of future river abstractions and plan to protect minimum flows through control of abstraction.	Investigations currently being carried out by consultants both nationally and regionally, to determine the scale of future demands for river abstractions and their environmental impacts. Monitor the water usage within the supply zones of Leeds and Bradford to ensure water undertakers are meeting requirements set by OFWAT and the DoE. Review existing policies for the determination of groundwater and surface water abstraction licenses. Assess minimum river flows at all measuring sites to ensure the base flow of the river is protected.
Aquifer Protection	
Prevention of pollution of groundwater.	Implement the NRA Groundwater Protection Policy through staff training and promotion of the guidelines to Planning Authorities, landowners and dischargers within the catchment. Delineate groundwater protection zones for the major groundwater sources.

	RESPONSIBILITY	BENEFITS
	NRA	Provision of a framework for the strategic management of water resources.
	YWS	Ensure abstractions are used efficiently to protect water environment.
	NRA	Protection of groundwater and surface water resources.
	NRA	Better understanding of the determination and use of minimum acceptable flows.
	NRA	Protect quality and quantity of groundwater resources.
	NRA	Protection of specific groundwater sources and improved efficiency in dealing with enquiries and proposals.

OBJECTIVE	PROPOSALS
ISSUE 5.1: STRATEGIC *contd*	
Pollution Prevention	
Maintain and improve water quality in the catchment by effective pollution prevention measures.	Undertake investigations and recommend pollution prevention measures on trade premises.
	Continue to visit farms in selected catchments on a priority basis to recommend pollution prevention improvements.
	Ensure Yorkshire Water Services (YWS) Ltd continues its programme of improvements to discharges from combined sewer overflows (CSO's) and public surface water sewers.
	Continue to investigate the failure of package sewage treatment works to achieve satisfactory performance on commercial premises.
Ecology, Recreation and Amenity	
Protect existing wildlife and their habitats under the existing legislation.	Continue to follow up the work of the Otters and Rivers Project to identify and encourage appropriate habitat management for otters.
	Encourage the return of otters to the catchment through collaboration with outside organisations and education of landowners and the public.
	Maintain and increase habitat diversity to protect and enhance flora and fauna working with English Nature, Yorkshire Wildlife Trust, local authorities and other interested organisations.

RESPONSIBILITY	BENEFITS
NRA/INDUSTRY	Maintain and improve water quality.
NRA/ LANDOWNERS	
NRA/YWS	
NRA	
NRA YWT - OTTERS & RIVERS PROJECT	Recolonisation of otters within the catchment
NRA/EN/YWT/ LOCAL AUTHORITIES	
NRA/EN/YWT/LOCAL AUTHORITIES	

OBJECTIVE	PROPOSALS
ISSUE 5.1: STRATEGIC *contd*	
Protect, maintain and increase areas of conservation value within the catchment in conjunction with other agencies and link conservation sites in accordance with Article 10 of the Habitats Directive.	Encourage links between sites of high conservation interest in accordance with Article 10 of the Habitats Directive.
	Encourage and promote the Countryside Stewardship Scheme for landowners and continue links with the Farming and Wildlife Advisory Group, National Farmers Union and Country Landowners Association.
	Promote the establishment of buffer zones through the MAFF Set Aside Scheme and the newly proposed MAFF Agri-Habitat Scheme.
	Work with the Forestry Authority to encourage the creation of new wood lands and the good management of existing areas through available grant schemes where appropriate.
	Support the aims of the Nidderdale Area of Outstanding Natural Beauty (AONB) in protecting the landscape.
Maintain and improve ecological water quality within the catchment.	Respond reactively to requests to analyse waters for blue green algae and advise and inform the relevant authorities.
	Examine, through collaboration with other organisations, the effect of land management changes in the upper catchment on stream sedimentation and ecology.

RESPONSIBILITY	BENEFITS
NRA	Improve conservation value of the catchment through environmental sensitive farming practices.
NRA/FWAG	
NRA/FWAG	Improve the conservation value of the river banks.
NRA/FA	Increase woodland area along river corridors.
NRA/LOCAL AUTHORITIES	Protection of landscape.
NRA/LOCAL AUTHORITIES	Protect people & environment from blue green algae.
NRA	To provide management information and gain a better understanding of the processes involved.

OBJECTIVE	PROPOSALS
ISSUE 5.1: STRATEGIC *contd*	
Protect native crayfish populations.	Assess the extent of populations of the native white-clawed crayfish in the catchment.
	Monitor the spread and impact of American signal crayfish in the Wharfe especially in White Beck.
	Contribute to and support proposals for an exclusion zone under the Habitats Directive delineating an area where it would be harmful to introduce American signal crayfish.
	Continue to monitor and take measures to protect the populations of native crayfish.
Promote and further recreation where it will not have a detrimental impact on the water environment.	Encourage and promote improvements to access to the river.
	Investigate the potential for collaborative projects with other organisations in rural and suburban area to improve access to river corridors.
Improve facilities for people with disabilities.	Investigate the potential for collaborative projects to improve access and facilities for people with disabilities.
Archaeology	
Protect area of archaeological and heritage interest.	Develop a database on heritage and archaeological sites through liaison with relevant organisations.
	Work with other organisations to protect the integrity of heritage features in both catchments.

RESPONSIBILITY	BENEFITS
NRA	Provide management information to protect crayfish.
NRA	Protect nature crayfish populations.
NRA/MAFF/EN	
NRA	
NRA/SPORTS COUNCIL	Improve recreational access to rivers.
LOCAL AUTHORITIES	
NRA	Improve riverside access and facilities for people with disabilities.
NRA/LOCAL AUTHORITIES	Provide management information.
NRA/LOCAL AUTHORITIES	Protect heritage sites.

OBJECTIVE	PROPOSALS
ISSUE 5.1: STRATEGIC *contd*	
Flood Defence	
Provide and maintain flood defences.	Investigate and record the condition of Flood Defence Assets and prepare a priority based programme of repair, renewal and maintenance.
	Investigate controlled washlands within the catchment and register those washlands which come within the scope of the 1975 Reservoirs Act.
	Investigate the provision of additional relief outfalls to evacuate washlands as soon as possible after flood has subsided.
Improve efficiency and effectiveness of the NRA's emergency response.	Investigate and record the condition of all existing flood defence structures within the catchment.
	Modify where economically and practically possible flood defence structures to enable remote operation utilising the Regional Telemetry System.
	Consider replacing structures which cannot be readily adapted for remote operation.
	Investigate the feasibility of providing CCTV at critical flood defence structures.

	RESPONSIBILITY	BENEFITS
	NRA	
	NRA	
	NRA	
	NRA	Protect people and property from flooding.
	NRA	
	NRA	
	NRA	

OBJECTIVE	PROPOSALS
ISSUE 5.1: STRATEGIC *contd*	
Continue to refine and improve the Flood Warnings System through incorporation of the Regional Telemetry System and the River Flow Forecasting System.	Continue to liaise with the Police and Local Authorities to ensure that procedures are in place to respond to NRA warnings. Ensure the provision of a timely, reliable and accurate Flood Warning Service.
Future Development	
Fully participate in the Local Authority planning process to ensure protection of the water environment.	Participate fully in the development control process and where necessary oppose any proposals that will damage the water environment. Participate fully in the strategic planning process and provide guidance to local councils through their development plans. Ensure that NRA interests are not adversely affected by future mineral extraction in the Wharfe Valley.
Ensure that the NRA's catchment management plan is adopted as a strategy for the future management of the water environment of the Nidd & Wharfe catchment.	Produce the Nidd & Wharfe CMP following 3 months external consultation. Positively promote the concept of catchment management planning. Monitor and review the CMP annually.

RESPONSIBILITY	BENEFITS
NRA/POLICE/LOCAL AUTHORITIES	Protect people and property from flooding.
NRA/LOCAL PLANNING AUTHORITIES/ OTHERS	Protect all aspects of the water environment.
NRA/LOCAL PLANNING AUTHORITIES	
NRA	
NRA	Final plan will define a strategy for future management.
NRA/LOCAL PLANNING AUTHORITIES/OTHERS	Close liaison/links with LPA's.
NRA	Ensure actions are carried out and assessed

OBJECTIVE	PROPOSALS
ISSUE 5.2: LOW FLOWS ON THE WHARFE	
Alleviate low flow problems in the River Wharfe at Otley and Pool.	Examine current abstraction licences and in consultation with licence holders discuss possible alterations to the abstraction regime to obtain minimum flows over Pool and Otley weirs for the benefit of the river environment.
ISSUE 5.3: RESERVOIRS	
Gouthwaite	
Obtain improved compensation releases from Gouthwaite Reservoir.	Investigate modification of operating rules.
	Examine siltation in the reservoir.
	Examine compensation releases from Gouthwaite Reservoir in relation to low flows and the effects of STW's in order to maintain river quality.
	Contribute ecological data to evaluate any future proposals for limited desilting of Gouthwaite Reservoir which aims to minimise any reduction in reservoir storage capacity.
	Ensure that any changes to the management agreement for Gouthwaite Reservoir protect flood defence and ecological interests.
Limit the impact of any future transfers of water out of the catchment on the river ecology.	Ensure that any proposals for the additional transfer of water out of the catchment are subject to full assessment of their impact on the river ecology.

RESPONSIBILITY	BENEFITS
NRA	Improvement in river reaches affected by low flows.
YWS/GOUTHWAITE BOARD OF MANAGEMENT	Improved use of compensation release to provide better flows in the river system.
NRA	Provision of better flows for dilution.
NRA	
NRA	To maximise the storage capacity of the reservoir and protect the water environment.
NRA	Protect people & property from flooding
NRA	Protect the water environment.

OBJECTIVE	PROPOSALS
ISSUE 5.3: RESERVOIRS ***contd***	
Grimwith	
Manage the introduced stock of arctic charr to maintain its conservation value.	Develop and implement a management strategy in conjunction with YWS Ltd for arctic charr in Grimwith Reservoir.
Minimise the ecological effect of compensation releases from reservoirs to the water environment.	Assess the effects of compensation releases from Grimwith Reservoir on flow regimes and temperature and their consequent impact on fish populations and angling activity.
	Negotiate with YWS Ltd to set minimum compensation releases from Grimwith Reservoir and the Barden Reservoirs to protect the water environment.
Washburn Valley	
Minimise the impact of intermittent releases from the Washburn Valley Reservoirs on the water environment.	Investigate with YWS Ltd methods of reducing the impact of intermittent releases from Thruscross Reservoir.
	Investigate with YWS Ltd the impact of compensation flows from Lindley Wood Reservoir on the lower washburn.

RESPONSIBILITY	BENEFITS
NRA/YWS	To protect and manage arctic charr populations.
NRA	Protect the river ecology.
NRA/YWS	Protect the river ecology.
NRA/YWS	Protect river environment.
NRA/YWS	

OBJECTIVE	PROPOSALS
ISSUE 5.3: RESERVOIRS *contd*	
Maintain RQO of the River Washburn and its tributaries to protect its use as a potable supply catchment.	Continue to maintain pressure for improvements at farms identified presenting a risk of pollution. Maintain close liaison with YWS Ltd to identify other sites which represent a potential risk. Continue to monitor the quality of the river and main feeder streams in conjunction with YWS Ltd. Respond rapidly to any incident that is likely to endanger the security of supply and closely liaise with YWS Ltd in the event of such an incident Maintain stringent controls on development in the catchment. Employ prohibition notices on new developments stipulating that in each case the appropriate means of sewage treatment and disposal is agreed with the NRA.

RESPONSIBILITY	BENEFITS
NRA/LANDOWNERS	Maintain and improve water quality.
NRA/YWS	
NRA/YWS	
NRA	Reduce likelihood of contamination of raw water supply.
NRA	Protection of existing water quality.
NRA	

OBJECTIVE	PROPOSALS
ISSUE 5.4: WATER QUALITY PROBLEMS	
Ensure replacement of the Glasshouses STW by the earliest possible date to secure the RQO of the Nidd below the works.	Seek to ensure that YWS Ltd progress the proposed scheme for replacement of Glasshouses STW within the projected timescale of 1995.
Investigate intermittent elevated ammonia and solids levels in the upper Nidd which are coincident with high flow conditions.	Undertake a survey of the river and its tributaries using chemical and ecological techniques during predetermined weather conditions.
Achieve RQO in Coppice Beck and Oak Beck below Harrogate.	Continue a programme of monitoring the effects of the combined sewer over-flows (CSO's) and cross connections on the watercourse.
	Ensure YWS Ltd and the local authority to carry out investigative work to identify the problem CSO's and contaminated surface water drains and to schedule improvement works accordingly.
	Finalise drainage area plan, with the aim of prioritising problem CSO's for subsequent improvement.
Achieve RQO in the Nidd between Harrogate and Fleet Beck.	Achieve RQO in Coppice Beck and Oak Beck.
	Maintain pressure on YWS Ltd to improve effluent quality from Harrogate North STW.

RESPONSIBILITY	BENEFITS
NRA/YWS	Achieve RQO.
NRA	Establish cause of high ammonia and solids levels.
NRA	Achieve RQO.
YWS/LOCAL AUTHORITY	
NRA/YWS	Improve chemical quality and achieve RQO.
YWS	

OBJECTIVE	PROPOSALS
ISSUE 5.4: WATER QUALITY PROBLEMS *contd*	
Achieve RQO in River Crimple below Harrogate South STW.	Maintain pressure on YWS Ltd to improve effluent quality from Harrogate South STW.
	Ensure YWS Ltd and the local authority to carry out investigative work to identify problem CSO's and contaminated surface water drains discharging to the Crimple or its tributaries and to schedule improvements following criteria laid down in AMP2.
Achieve Class 2 water quality in Fleet Beck downstream of Tockwith Industrial Estate.	Maintain pressure on local companies to provide an acceptable means of sewage treatment and disposal for the whole site.
	Limit development of this and similar sites through planning controls and/or the use of prohibitions unless adequate sewage treatment is available
Maintain the RQO of the upper Wharfe particularly in summer, when tourism places the greatest demand on sewage treatment installations when river flows are at their lowest.	Closely monitor performance of community and private sewage treatment works and continue to review consents to discharge.
Maintain RQO downstream of Bolton Bridge to protect potable abstractions at Lobwood and Hollins.	Respond rapidly to any incident that is likely to endanger the security of supply, and liaise closely with YWS Ltd in the event of such an incident.

	RESPONSIBILITY	BENEFITS
	NRA/YWS	Improve chemical water quality to achieve RQO.
	NRA/YWS/LOCAL AUTHORITY	
	NRA/INDUSTRY	Improve chemical water quality.
	NRA/LOCAL PLANNING AUTHORITY	Limit unacceptable development.
	NRA	Protection of chemical water quality.
	NRA/YWS	Maintain chemical water quality to ensure suitability for potable supply.

OBJECTIVE	PROPOSALS
ISSUE 5.4: WATER QUALITY PROBLEMS *contd*	
Achieve RQO in Sun Lane Beck below the disused municipal waste disposal site abandoned some 25 years ago.	Successful discussions with the local authority have resulted in a remediation scheme being proposed. The NRA will continue to ensure that the scheme is progressed to a satisfactory conclusion and achievement of the RQO for the watercourse.
	Monitor and assess the recovery of biological communities following the implementation of the remedial scheme.
Determine the reason for disparity in chemical and biological classifications in Weeton Beck.	Undertake biological investigation to determine cause of current poor quality
Investigate the cause of downgrading the Wharfe below Wetherby from Class 1A to 1B.	Model the river stretch to determine the predicted quality.
	Monitor the discharges from Newton Kyme village and Thorp Arch industrial estate to measure their effect on the river.
Achieve Class 2 water quality in St Helens Dyke below Thorp Arch industrial estate.	Develop a strategy to address the problems of contaminated drainage originating from this large industrial estate.
Achieve Class 2 water quality in the dykes at Newton Kyme which are affected by domestic sewage discharges.	Continue to maintain pressure on the residents of the village to provide satisfactory sewage treatment for properties that currently discharge untreated sewage to the watercourse.

RESPONSIBILITY	BENEFITS
NRA/LOCAL AUTHORITY	Achieve RQO.
NRA	Improvement in biological communities.
NRA	Resolution of chemical biological disparity.
NRA	Determine cause of downgrading.
NRA	
NRA/INDUSTRY	Achieve RQO.
NRA	Improvement of chemical water quality to achieve RQO.

OBJECTIVE	PROPOSALS
ISSUE 5.4: WATER QUALITY PROBLEMS *contd*	
Achieve RQO in the upper reaches of Cock Beck.	Investigate the impact of CSO's surface water discharges and Barwick STW. Prioritise the works which will provide the most effective a means of achieving RQO.
	Carry out a catchment survey using chemical and biological techniques to identify the persistent cause of these failures so that appropriate action can be taken.
Maintain and improve ecological water quality within the catchment.	Monitor and assess the impact of effluents discharged from the breweries in the Tadcaster area on ecological water quality.
	Investigate the causes of poor and fluctuating biological quality in the Wharfe, in particular, Baffle Beck, Collingham Beck and Riffa Beck.
	Monitor and assess the recovery of biological communities following removal or improvement in quality of polluting discharges into watercourses such as Town Beck.
	Continue monitoring the effect of discharges from Paper Mills on the ecological quality of the River Wharfe.

	RESPONSIBILITY	BENEFITS
	NRA	
	NRA	Improve chemical water quality to achieve RQO.
	NRA	
	NRA	
	NRA	Improve biological water quality.
	NRA	

OBJECTIVE	PROPOSALS
ISSUE 5.5: ACIDIFICATION	
Investigate acidification in the upper tributaries of the Nidd and localised areas of the Wharfe.	Assess the extent and impact of acidification on the ecology of the upper tributaries of the Nidd especially Ashfoldside Beck. Investigate and assess the practicalities of possible remedial measures. Link local investigations with current NRA sponsored research on acidification in Yorkshire steams and rivers being undertaken at Huddersfield University. Limit activities which may accelerate acidification through input into the planning process.
ISSUE 5.6: FISH FARMS	
Minimise the impact of fish farms on the ecology of the catchment.	Monitor the impact of trout farms on the ecology of the rivers Nidd and Wharfe in particular those at Low Laithes and Glasshouses. Undertake biological surveys to assess the effect of fish farm abstractions and discharges. Implement measures to eliminate the escape of fish through liaison with fish farms owners. Regularly monitor fish farm structures and management practices. Establish closer working links with MAFF in connection with the licensing of fish farms.

RESPONSIBILITY	BENEFITS
NRA	Provide information on acidification and possible measures to ameliorate the situation.
NRA	
NRA/ HUDDERSFIELD UNIVERSITY	
NRA	
NRA	Protect water environment.
NRA	
NRA/FISH FARM OWNERS	
NRA/FISH FARM OWNERS	
NRA	

OBJECTIVE	PROPOSALS
ISSUE 5.6 FISH FARMS *contd*	
	Through planning procedures and NRA consents ensure that new farms are not established at inappropriate locations.
Investigate the impact of Kilnsey Park fish farm on the water quality of White Beck.	Continue chemical and biological monitoring of the effluent and watercourse to assess the impact and if necessary review the consent to reflect the downstream quality required.
Maintain the RQO of Hebden Beck downstream of Yorkshire Salmon Fish Farm.	Closely monitor the fish farm effluent particular at peak loads and assess the effects of these in the light of the revised consent and the downstream water quality.
Achieve RQO downstream of the Washburn Valley Trout Farm.	Monitor the performance of the farm against the recently revised consent. Maintain pressure on the company to undertake further works until consistent consent compliance is achieved.

RESPONSIBILITY	BENEFITS
NRA/MAFF	Prevent inappropriate development.
NRA	Protection of headwater streams.
NRA	Maintain water quality.
NRA	Achieve RQO.
NRA	

OBJECTIVE	PROPOSALS
ISSUE 5.7 FISHERIES	
Produce a strategy for the re-establishment of salmon in the River Wharfe.	Investigate measures to ensure unhindered passage of smolts and adult salmon between Linton Falls and the River Ouse.
	Encourage the establishment of stock genetically adapted to the river by eliminating introductions of stock from other rivers.
	Introduce a monitoring programme as a basis of informed management.
Monitor and develop appropriate management procedures for brown trout fisheries in the Nidd and Wharfe.	Use genetic methods to test stocks for genetic integrity.
	Conserve important genotypes of trout.
	Promote the development of self sustaining stocks and reduce the requirement for stocking by encouraging angling management to move away from put and take and towards catch and release management.
	Protect and improve the spawning and nursery areas to increase natural recruitment.
	Encourage management of the upper Wharfe as a brown trout fishery, retaining Linton Falls as the upstream limit of salmon populations.

RESPONSIBILITY	BENEFITS
NRA	Provide information to enable free passage of salmon.
NRA	Maintain integrity of local stocks.
NRA	Provide management information.
NRA	
NRA	
NRA	Maintain integrity of local stock.
NRA	Protect fish populations.
NRA	Protect trout fishery.

OBJECTIVE	PROPOSALS
ISSUE 5.7 FISHERIES *contd*	
Investigate the decline in grayling stocks in the River Wharfe.	Monitor existing stocks of grayling at Bolton Abbey estate and provide advice to improve stocks.
	Establish whether there has been a decline in grayling stocks at other locations in the catchment and identify the causes.
	Implement or encourage measures to reverse identified stock declines.
Develop a strategy relating to the upstream spread of coarse fish into salmonid waters in the Wharfe.	Monitor the upstream spread of coarse fish into salmonid waters.
	Develop a strategy for the management of mixed fisheries.
Improve fish passage over weirs.	Assess the arrangements for fish passage at all weirs, especially Birstwith, Cowthorpe and Knaresborough on the Nidd; Boston Spa and Burley on the Wharfe, and negotiate improvements where necessary.
	Evaluate measures to improve passage of fish over Skip Bridge Gauging Weir on the Nidd.
	Refurbish the fish pass at Flintwell Weir on the Wharfe.
	Negotiate with paper mill owners for the installation of fish passes at Otley and Pool weirs.

RESPONSIBILITY	BENEFITS
NRA	
NRA	Protect grayling populations.
NRA	
NRA	
NRA	Provide information for management of coarse and mixed fisheries.
NRA	
NRA/RIPARIAN OWNER	
NRA	Improve passage of fish.
NRA	
NRA/PAPER MILL OWNERS	

OBJECTIVE	PROPOSALS
ISSUE 5.7 FISHERIES *contd*	
Protect and improve the quality of fishery habitats in the catchment.	Undertake collaborated projects with angling clubs to improve the fishery habitat of the river and its tributaries.
Minimise the impact of river abstractions on the fishery of the River Wharfe.	Assess the extent of entrainment of fish at river intakes.
	Take measures, through liaison with mill owners, to ensure that fish, including smolts, are not entrained at paper mill intakes.
	Investigate the effects of the abstraction at Lobwood and Arthington on flow regimes and temperature in the River Wharfe and their subsequent impact on fish populations and angling activity.
Assess the potential for restoration of the fisheries in tributaries in the Harrogate and Knaresborough area suffering from the effect of combined sewer overflows.	Use ecological techniques to assess the success of improvements to the existing CSO systems in terms of improving water chemistry, invertebrate and fish life.
Investigate habitat diversity, fishery and biological quality in the Buckden/Kettlewell area as a result of past maintenance works.	Evaluate both active and passive methods to restore the habitat and take remedial action where possible.
	Monitor fish stocks in this length to assess speed and extent of recovery.

RESPONSIBILITY	BENEFITS
NRA/ANGLING CLUB	Improve riverside habitats.
NRA/PAPER MILL OWNERS	Protect fish populations.
NRA	
NRA	
NRA	Protect water environment.
NRA	Assess fish populations.
NRA	

OBJECTIVE	PROPOSALS
ISSUE 5.8 EROSION	
Investigate the problems of bankside erosion and provide advice to land-owners on appropriate erosion control measures in order to protect and enhance the water environment.	Evaluate the options to resolve problems of erosion. Provide advice to land owners on alternatives to tipping, riverine processes and the legal requirements for work in rivers. Assess the feasibility of erosion protection works at Ilkley groynes. Undertake a study to investigate the problem of erosion in Upper Wharfedale with the Yorkshire Dales National Park.
ISSUE 5.9 HABITAT IMPROVEMENTS	
Improve river environment in the lower reaches of the Nidd downstream of Tockwith.	Instigate further tree planting and encourage sensitive farming practices wherever possible. Investigate the feasibility of installing small instream structures such as groynes to provide a more varied habitat for the benefit of fish life.
Protect, maintain and increase areas of conservation value within the catchment in conjunction with other agencies.	Work in partnership with North Yorkshire County Council, Harrogate Borough Council and other parties on an initiative for landscape/wildlife conservation in priority areas already identified in Harrogate District. Work in partnership with the Hawk and Owl Trust, Harrogate Borough Council and others to improve habitats for barn owls in the Harrogate area.

RESPONSIBILITY	BENEFITS
NRA	Protect river banks and the river environment.
NRA/ LAND OWNERS	
NRA	
NRA/YDNP/ LAND OWNERS	
NRA/LOCAL AUTHORITIES/ LAND OWNERS	Improve riverside habitats, flora, and fauna.
NRA	
NRA,NYCC, HBC	
NRA, HAWK & OWL TRUST, HBC	Improve habitats for barn owls and increase their populations.

OBJECTIVE	PROPOSALS
ISSUE 5.10 DEVELOPMENT OF ROAD NETWORKS	
Ensure that there is no risk of flooding, or damage caused to habitats, flora, fauna and fisheries when determining proposals to culvert, divert, or alter a water-course and its bank or change the use of flood plain associated with road improvement works within the catchment.	Provide ecological advice to help ensure the proper balancing of surface water flows from new road developments through the NRA's input into the planning process. Ensure that NRA interests are not adversely affected by the A1 widening which involves crossing the River Wharfe, the River Nidd, Cock Beck and Bramham Beck. Monitor the ecological effects of increased suspended solids in the water system as a result of the A1 widening scheme within the catchment. Ensure through the planning process that the A1 M1 link road has a limited impact of Cock Beck. Ensure that NRA interests are not adversely affected by the proposed Harrogate Bypass. Monitor the ecological effects of the construction of the Harrogate ring road on the River Nidd and tributaries. Provide ecological advice to help minimise the impact of the north and west sections of the Harrogate ring road on the River Nidd, Oak Beck and other tributaries. Ensure through the planning process that the proposed Ilkley Bypass is routed and constructed so as to minimise damage to the River Wharfe and its tributaries.

RESPONSIBILITY	BENEFITS
NRA/DoT/ LOCAL PLANNING AUTHORITIES	Protect people and property from flooding.
NRA	Protect valued habits.
NRA/DoT/ LOCAL PLANNING AUTHORITIES	Protect water quality.
NRA/DoT/ LOCAL PLANNING AUTHORITIES	
NRA	Protect ecological value.
NRA	
NRA/DoT/ LOCAL PLANNING AUTHORITIES	Protect valued habitats.

OBJECTIVE	PROPOSALS
ISSUE 5.10 DEVELOPMENT OF ROAD NETWORKS *contd*	
Ensure that there is no risk of flooding, or damage caused to habitats, flora, fauna and fisheries when determining proposals to culvert, divert, or alter a water-course and its bank or change the use of flood plain associated with road improvement works within the catchment.	Monitor the construction of the Burley-in-Wharfedale Bypass and Manor Park Bends improvements to check compliance with the Consents to Works in Rivers issued under the Water Resources and Land Drainage Acts 1991. Ensure that flood defence interests are not adversely affected by the DoT road schemes at Burley-in-Wharfedale. Investigate the possibility of contributing to DoT compensatory storage works with a view to reducing flood levels at Otley. Monitor fish stocks before and after the diversion of the River Wharfe for the construction of the Burley Bypass. Diversion work started. Ensure all construction works on the A65 are closely monitored. Where there is a known risk, work to be carried out only after close liaison with the NRA and following guidance. Monitor the effect of the construction of the new Bolton Bridge over the River Wharfe and its tributary Hambleton Beck on the water environment. Assess ways of restoring habitats and fish populations in Pace Gate Beck, previously damaged by A59 construction works.

RESPONSIBILITY	BENEFITS
NRA	Protect water quality.
NRA/DoT	Protect people & property from flooding.
NRA	Protection of fish populations.
NRA	Protection of the water environment.
NRA	Protection of water environment.
NRA	

OBJECTIVE	PROPOSALS
ISSUE 5.11 FLOODING PROBLEMS AND FLOOD WARNINGS	
Provide and maintain flood defences	Investigate the feasibility of providing an economically and environmentally acceptable flood protection scheme at Pateley Bridge.
	Investigate the feasibility of providing an economically and environmentally acceptable flood protection scheme at the following:- Bolton Bridge, Otley, Addingham, Firgreen Beck, Bramham, Collingham.
Continue to refine and improve the flood warnings system through incorporation of the Regional Telemetry System and the River Flow Forecasting System.	Consider the possibility of preparing flood warnings for Knaresborough and implement as appropriate.
	Consider the provision of a forecast point at Knaresborough.
	Fully implement into the formal flood warning procedures additional flood warnings for areas at risk including Bolton Bridge, Addingham, Ilkley, Burley, Otley, Pool, Collingham and Wetherby.

	RESPONSIBILITY	BENEFITS
	NRA	
	NRA	
	NRA	Protect people & property from flooding.
	NRA	
	NRA	

6.0 GLOSSARY OF TERMS

Abstraction	Removal of water from surface water or groundwater, usually by pumping.
Abstraction Licence	Licence issued by the NRA under s.38 of the Water Resources Act 1991 to permit water to be abstracted.
Ammonia	A chemical found in water often as the result of discharge of sewage effluents. High levels of ammonia affect fisheries and abstractions for potable water supply.
AMP (Asset Management Plans)	For the purposes of this document Asset Management Plans can be considered as the means by which thewater undertakers (eg Yorkshire Water Services Ltd) plan the work required and the capital expenditure necessary, for improvements and maintenance of the water supply, sewage treatment works and sewerage systems. These are drawn up through consultations with the NRA and other bodies to cover a five year period. The Asset Management Plans have to be agreed by the Department of the Environment and OFWAT.
Aquifer	A layer of underground porous rock which contains water and allows water to flow through it.
AOD	Above Ordnance Datum. Equivalent to mean sea level.
Area of Outstanding Natural Beauty (AONB)	Areas of Outstanding Natural Beauty are designated under the National Parks and Access to the Countryside Act 1949 by the Countryside Commission. Their primary purpose is to conserve natural beauty.
Asulam	Asulam is a herbicide used to control bracken.
Base Flow	Part of a stream's flow made up of groundwater; it sustains the stream during dry periods.
Biochemical Oxygen Demand (BOD)	A measure of the amount of oxygen consumed in water during the breakdown of organic matter.

Catchment	The total area of land which contributes surface water to a specified watercourse or water body.
CMP	Catchment Management Planning.
Combined Sewer Overflow (CSO)	An overflow structure which permits a discharge from the sewerage system during wet weather conditions.
Controlled Waste	Defined by Control of Pollution Act 1974, Part 1 Section 30. It includes household, industrial and commercial waste.
Controlled Waters	Defined by the Water Resources Act 1991 Part III Section 104. They include groundwaters, inland waters and estuaries.
Cumecs	Cubic metres per second.
Dangerous Substances	Substances defined by the European Commission as in need of special control because of their toxicity, bioaccumulation and persistence. The substances are classified as List I or List II according to the Dangerous Substances Directive.
Diffuse Pollution	Pollution from widespread activities with no one discrete source.
Discharge Consent	A statutory document issued by NRA under Schedule 10 of the Water Resources Act 1991 to indicate any limits and conditions on the discharge of an effluent to a controlled water.
Dissolved Oxygen	The amount of oxygen dissolved in water. Oxygen is vital for life so this measurement is an important, but highly variable, indicator of the 'health' of a water. It is used to classify waters.
DoE	Department of the Environment.
DoT	Department of Transport.
Drift Deposits	Term used to include all unconsolidated superficial deposits (eg fluvial, glacial, alluvial etc) overlying solid rock.
DWF	Dry Weather Flow
Effective Rainfall	The rain remaining as runoff after all losses by evaporation, interception and infiltration have been allowed for.

EN	English Nature.
Environmental Quality Standard (EQS)	The quantity of a substance found in a body of water which should not be exceeded in order to protect a given use of the water body. An EQS is set by the European Community through EC Directives and the government.
Evapotranspiration	The loss of moisture from the earth's surface by means of direct evaporation together with transpiration from vegetation. (Transpiration - the process by which plants lose water vapour through the stomata (pores) on their leaves, thereby extracting soil moisture and returning it to the atmosphere).Potential evapotranspiration - assumes an unrestricted supply of water to the earth's surface and refers to the theoretical maximum loss of moisture. Actual evapotranspiration - is the observed or true loss of moisture.
Fissure Flow	Groundwaters flow through an aquifer by a combination of fissure flow through the cracks in the rocks and intergranular flow through the pore spaces of the rock matrix.
Flood Plain	This includes all land adjacent to a watercourse over which water flows or would flow but for flood defences in times of flood.
Groundwater	Water which is contained in saturated rock.
Headwater	Streams close to their source (in the context of the R&D project defined as being either first or second order, within 2.5 kilometres of the stream source or with a mean annual flow of no more than 0.31 cumecs)
HMIP	Her Majesty's Inspectorate of Pollution.
House Equivalent	A measure used for assessing the value of property and land protected against flooding by flood defences.
Hydrograph	The graph of groundwater levels, river levels or river flow plotted.
Impounding Reservoir	A man-made water-retaining structure.
Infiltration	Process by which fluid enters into the pores of a solid.

LPA	Local planning authority.
Leachate	Liquor formed by the process of leaching.
Leaching	Removal of soluble substances by action of water percolating through soil, waste or rock.
MAFF	Ministry of Agriculture, Fisheries and Food.
Macroinvertebrate	Animal lacking a backbone which are retained on a 0.5mm sieve.
Main River	Some but not all, watercourses are designated as 'Main River'. 'Main River' status of a watercourse must first be approved by MAFF. Statutory (legally binding) maps showing the exact length of 'Main River' are held by MAFF in London and the NRA in Regional Offices.The NRA has the power to carry out works to improve drainage or protect land and property against flooding on watercourses designated as 'Main River'. The NRA does not have the legal power to spend public funds on drainage or flood protection works on watercourses not designated as 'Main River'.
Mld	Megalitres per day.
mg/l	Milligrams per litre.
National Nature Reserve (NNR)	An area of land designated by English Nature under Section 35 of the Wildlife and Countryside Act 1981. They are managed by or on behalf of English Nature specifically for wildlife conservation purposes.
NRA	National Rivers Authority.
NWC	National Water Council.
NYCC	North Yorkshire County Council.
NYMNP	North York Moors National Park.
OFWAT	Office of Water Trading.
Population Equivalent (p.e.)	The volume and strengths of an industrial waste water expressed in terms of an equivalent population, based upon a figure of 0.06 kilogramme BOD per capita per day.

Potable Water	Water of suitable quality for drinking.
Prescribed Flow Condition	A condition attached to an abstraction licence such that if the river flow is less than a preset flow measurement, abstraction must cease until flows are restored.
Public Surface Water Sewer (SWS)	Sewers which transmit surface water run-off to a watercourse. The water should be uncontaminated and is the responsibility of the sewerage undertaker (in this case Yorkshire Water Services Ltd) to maintain and control.
Ramsar Sites	Internationally important wetland sites adopted from the Convention on Wetlands of International Importance especially as water fowl habitats (1971) and ratified by the UK government in 1976.
Rank vegetation	Coarsely overgrown vegetation.
Return Period	Refers to the return period of a flood. Flood events are described in terms of the frequency at which, on average a certain severity of flood is exceeded. This frequency is usually expressed as a return period in years, eg 1 in 50 years.
Riparian Owner	A person/organisation with property rights on a river bank.
River Corridor	Land which has visual, physical or ecological links to a watercourse and which is dependent on the quality or level of the water within the channel.
River Quality Objective (RQO)	The level of water quality that a river should achieve in order to be suitable for its agreed uses.
RSPB	Royal Society for the Protection of Birds.
RTS	Regional Telemetry System. The Regional Telemetry System allows up-to-the-minute information to be gathered by computers at an NRA office from outstations within the catchment. These outstations monitor river water level, flow and quality.

Silage	A winter feed for cattle. Silage is produced in the summer by bacterial action on freshly cut grass and is stored in a clamp or silo. Silage production results in the formation of a highly polluting effluent.
Site of Special Scientific Interest (SSSI)	A site given a statutory designation by English Nature or the Countryside Council for Wales because it is particularly important, on account of its conservation value.
Slurry	Animal waste in liquid form. Slurry is usually collected and stored in tanks or lagoons and is spread on farm land at a later date.
SPA	Special Protection Areas are internationally important sites designated under the EEC Wild Birds Directive.
Springs	Natural emergence of groundwater at the surface.
STW	Sewage Treatment Works.
SWQOs - Statutory Water Quality Objectives	Water quality objectives set by the Secretary of State for the Environment, in relation to controlled waters.
Strata	Layers of rock, including unconsolidated materials such as sands and gravel.
Sustainable (development)	Capable of being maintained at a steady level without exhausting natural resources or causing ecological damage.
TCMD	Thousand cubic metres per day, equivalent to Megalitres per day (Mld).
Trade Effluent	Effluent derived from a commercial process/premises.
ug/l	Microgrammes per litre.
Washlands	The area of the flood plain where water is stored in times of flood. Structures can be added to control the amount of water stored in the washland and time its release to alleviate peak flood flows in areas downstream.
WRA	Waste Regulation Authority.
WTW	Water Treatment Works.
YDNP	Yorkshire Dales National Park.
YWS Ltd	Yorkshire Water Services Ltd.

7.0 APPENDIX

NYCC	The draft third alteration to the County Structures Plan (adopted 1980) has been on deposit and the Public Local Inquiry ran from 16 November 1993 until 25 November 1993. The Inspector's Report was received in March 1994. The Green Belt Local Plan went to Public Local Inquiry from 15 September 1992 until 27 April 1993. The Inspector's report was received in March 1994.
YDNP	The National Park Plan First Review is undergoing a second review and will now be available for Public Consultation by Spring 1994. The park wide Local Plan was on deposit from the 12 February until the 26 March 1993. Objections have been reviewed and modifications have gone to Committee. A Public Local Inquiry was held in March 1994 and the Inspector's report is expected in the summer.
BRADFORD CITY	The Unitary Development Plan went out for Public Consultation from 1 February until 15 March 1993 and went on deposit from 1 November until 13 December 1993. A Public Inquiry is expected Autumn 1994.
CRAVEN	Work on the district wide Local Plan has started and Public Consultation on the draft will be late Spring/ early Summer 1994
HARROGATE	A draft district wide Local Plan is being prepared, the consultation draft is expected in Autumn 1994.
LEEDS CITY	The draft Unitary Development Plan has been out for Public Consultation and was on deposit from 28 June until the 27 August 1993. A Public Local Inquiry will commence on 18th October 1994 is expected to last 12 to 18 months.
SELBY	A draft district wide Local Plan is being prepared; Public Consultation is expected to take place in Autumn 1994.

NRA

National Rivers Authority

Northumbria and Yorkshire Region

Recycled Paper