EN AND SOLWAY COAST CATCHMENT MANAGEMENT PLAN CONSULTATION REPORT

NRA

National Rivers Authority
North West Region
October 1995

YOUR VIEWS

Public consultation is an important part of preparing a catchment plan, and allows people who live in or use the catchment to have a say in the development of NRA plans and work programmes.

The consultation report is our initial view of the issues facing the catchment. Resolving the issues is the key to achieving progress, and it is this section of the plan (section 4) which the NRA hopes will attract most comment.

The main questions we would ask you to consider in compiling your response are:-

Are there other options for resolving the issues?
Have all the major issues been highlighted?
What do you think is the best option for resolving each issue, and why?

A response form is provided at the back of the report to assist with your comments. Please use it.

All comments should be addressed to:

Mike Harrison
Area Catchment Planning Officer
National Rivers Authority
Chertsey Hill
London Road
Carlisle
CA1 2QX

The consultation perioed ends on Wednesday 31st January, 1996, so all comments should be returned by this date.

THE VISION

The catchment is one of great beauty containing unspoilt countryside and nationally important landscapes. The River Eden is home to some of Britain's best populations of rare species and is recognised as being of special nature conservation significance. In addition water quality is generally very good.

The catchment's exceptional qualities are enjoyed by thousands of people, in many different ways.

The primary purpose of this plan is to focus on sound policies and practices which will protect and enhance the value of the water environment in the catchment for the benefit of people and wildlife alike.

The bulk of the catchment is of good overall quality, although there are areas where improvements can be made, for example improvements to the ecological and aesthetic qualities of the Rivers Waver and Wampool. Future work will concentrate on protection, and where appropriate improvements and to this end, the NRA wishes to work in partnership with the local community and interested parties in moving towards a sustainable water environment.

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1.0 CATCHMENT MANAGEMENT PLANNING CONCEPT AND PROCESS

1.1 THE NATIONAL RIVERS AUTHORITY

The National Rivers Authority (NRA) is the principal agency responsible for safeguarding and improving the water environment in England and Wales. It has a wide range of responsibilities which include:-

- Improving water quality and controlling pollution.
- Flood defence and flood warning.
- Effective management of water resources.
- Maintaining and improving fisheries.
- Promoting water based recreation and amenity
- Promoting nature conservation in the water environment.

The natural geographical unit within which these responsibilities are discharged is the river catchment.

1.2 SCOPE AND PROCESS OF CATCHMENT MANAGEMENT PLANNING

The NRA view is that it can best carry out its work by adopting the concept of integrated catchment management. This means that a river catchment is considered as a whole and that the management of various activities are carried out within an overall integrated plan.

To achieve this the NRA will present its catchment proposals to the public via Catchment Management Plans. The Plans are intended to provide a link between the NRA and the "users" of the water environment in the catchment so that the Authority can better reflect their interests while carrying out its duties.

The production of NRA Catchment Management Plan involves three stages:-

- Production of the Catchment Consultation Report.
- Production of the Action Plan.
- Annual Review.

Consultation Report (This Document)

This document gives a brief analysis of the uses and activities on the catchment which have an impact on the water environment. Objectives are then required to protect/improve the water environment, and the current situation on the catchment is tested against the objectives.

This analysis identifies areas where objectives are not being met and these are highlighted as "issues" in the plan. Where possible, options for the resolution of issues are put forward and discussed. The NRA recognises that many of the options for action will involve organisations and individuals other than the NRA and their views will be crucial in the preparation of the action plan.

The management plan is intended to look approximately 5 years ahead, but the NRA also wishes to embrace the longer term aspirations of the community. For this reason a "vision" statement is proposed which is intended to express realistic aims for the catchment in the longer term.

Updates to consultation reports will normally be undertaken every 5 years.

Action Plan

The action plan will be produced following careful consideration of all comments received during consultation. Where appropriate, consultees comments will be taken on board in the action plan.

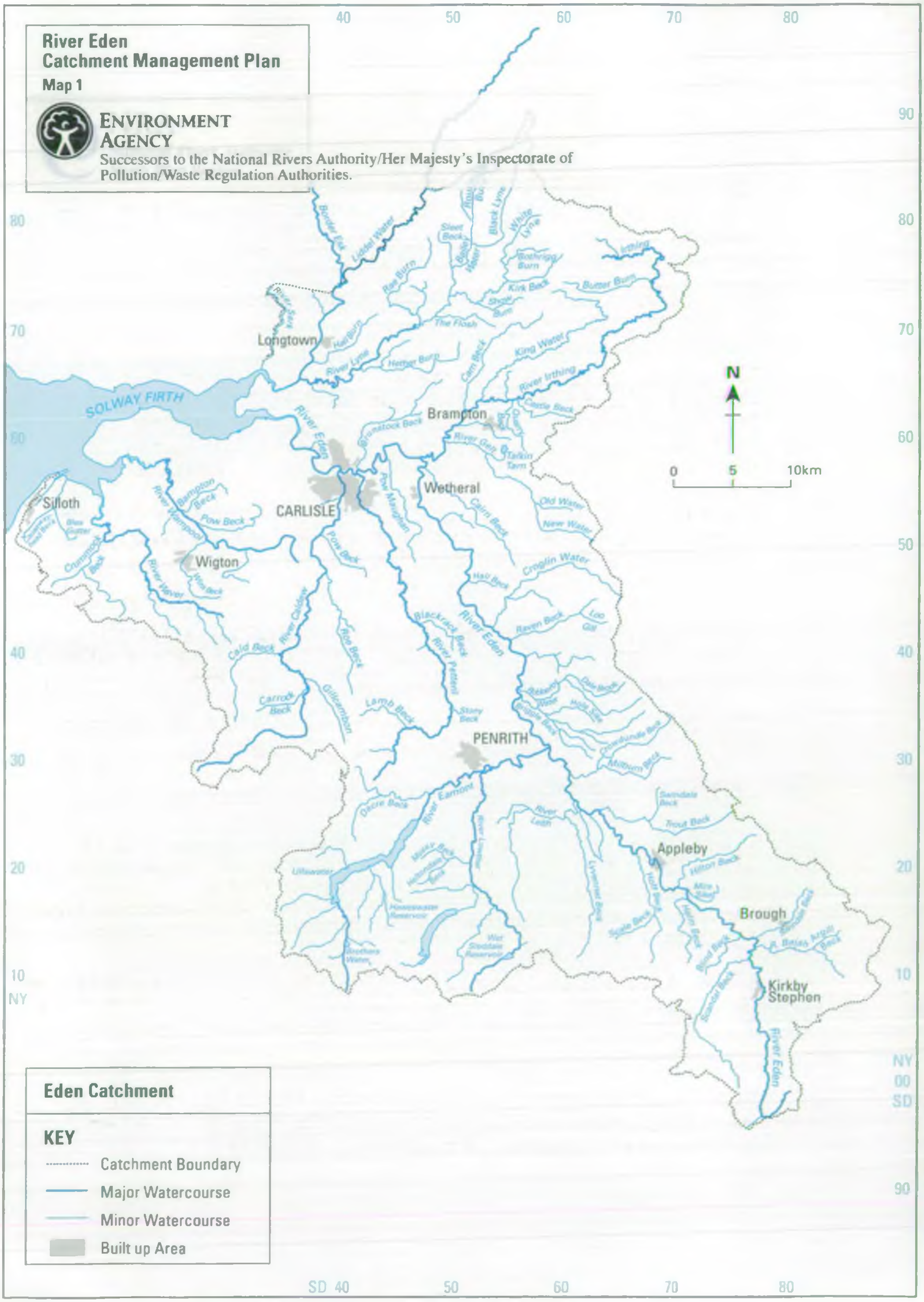
The action plan will be a much shorter document than the consultation report and will not contain the same level of detail on uses and analysis. Therefore, comments on these parts of the consultation report (sections 2 and 3) while welcomed and useful for future reviews etc. will not appear in the action plan.

The document will concentrate on the issues and actions for resolving them. It will form the basis of NRA actions over the 5 year plan period and also provide a public document and a framework for the NRA's interaction with other organisations. The NRA will be seeking a commitment to planned action by others wherever possible.

Annual Review

The NRA will be jointly responsible, with other identified organisations and individuals, for implementing the action plan. Progress will normally be monitored and reported annually, by means of a publicly available review document. This will contain the following information:-

- A detailed analysis of actual progress against planned progress.
- Identification of additional actions to maintain progress.
- Consideration of the need to update the plan.


River Eden
Catchment Management Plan
Map 1
ENVIRONMENT AGENCY
Successors to the National Rivers Authority/Her Majesty's Inspectorate of Pollution/Waste Regulation Authorities.
SOLWAY FIRTH
Longtown
Brampton
Wetheral
CARLISLE
Silloth
Wigton
PENRITH
Appleby
Brough
Kirkby Stephen
River Eden
River Eamont
River Irthing
River Petteril
River Caldew
River Lyne
River Wampool
River Waver
River Gelt
Liddel Water
Border Esk
King Water
Croglin Water
Cairn Beck
Ullswater
Haweswater Reservoir
N
0 5 10km
Eden Catchment
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area

2.0 CATCHMENT OVERVIEW

2.1 INTRODUCTION

The plan area covers approximately 2700 km² and includes the River Eden and its tributaries, the Rivers Waver and Wampool and the River Esk and its tributaries where they are in England. The NRA also has fisheries responsibilities for the River Esk in Scotland and this aspect is discussed in the plan.

The catchment contains 2 major still waters in Ullswater and Haweswater Reservoir as well as a number of smaller tarns and reservoirs.

The River Eden rises on high limestone fells above Mallerstang Common 708 metres above sea level. It then flows North in a wide and fertile valley sandwiched between the Lake District and North Pennines - before joining the Irish Sea on the Solway Firth some 100 kilometres from its source. Along the way the Eden is joined by a number of tributaries, including the Rivers Eamont, Lowther, Irthing, Petteril and Caldew.

The Waver and Wampool are relatively small lowland rivers. These 2 rivers have been subject to significant modification from channel management and land drainage practices and are therefore different in nature to the Eden system.

The catchment supports an important ecology with water being a key element in the resource, this perhaps being typified by English Nature's proposed Site of Special Scientific Interest (SSSI) designation for the River Eden system. The catchment is largely rural with agriculture and forestry being the most significant land uses.

The population on the catchment is approximately 167,000 with significant urbanisation being limited to the City of Carlisle (population approximately 70,000).

2.2 HYDROLOGY (SEE MAP 2)

Rainfall across the catchment is monitored at a number of monthly and daily rainfall gauges. In general the upland areas receive the highest rainfall with the Eden Valley being drier because of the rain-shadow effect caused by the Lakeland Fells.
For example Mosedale Cottage above Haweswater receives on average 3800 mm of rain a year compared to 660 mm at Thursby just west of Carlisle.

Run-off from the catchment is varied. Many of the upland tributaries are steep and rise on hard rock with little soil cover. This results in rapid run-off following rainfall. Because of this reliance on rainfall to maintain base flows in upland areas, natural low flows may occur here during prolonged dry periods.

Lower down the valley the limestone and sandstone aquifers are important factors in maintaining base flows. For example at Wetheral discharge from aquifers has been measured as contributing 340 Ml/d to the flow in the River Eden (1976).

The natural hydrology of the catchment has been significantly altered by abstraction for public water supply especially by those from Haweswater and the River Gelt.

There are 19 river/lake gauging stations on the catchment and these are an essential element in the NRA's flood warning system.

2.3 GEOLOGY AND HYDROGEOLOGY (SEE MAPS 3 & 4)

The catchment of the River Eden encompasses rocks of diverse age and type.

To the South West, the highlands of the central Lake District are formed from very old, altered and structurally deformed volcanic and sedimentary rocks. These slaty rocks are generally impermeable, except for some limited groundwater storage and movement at shallow depth. Although they are classed as **non-aquifer** they may be capable of supporting small scale private water supplies.

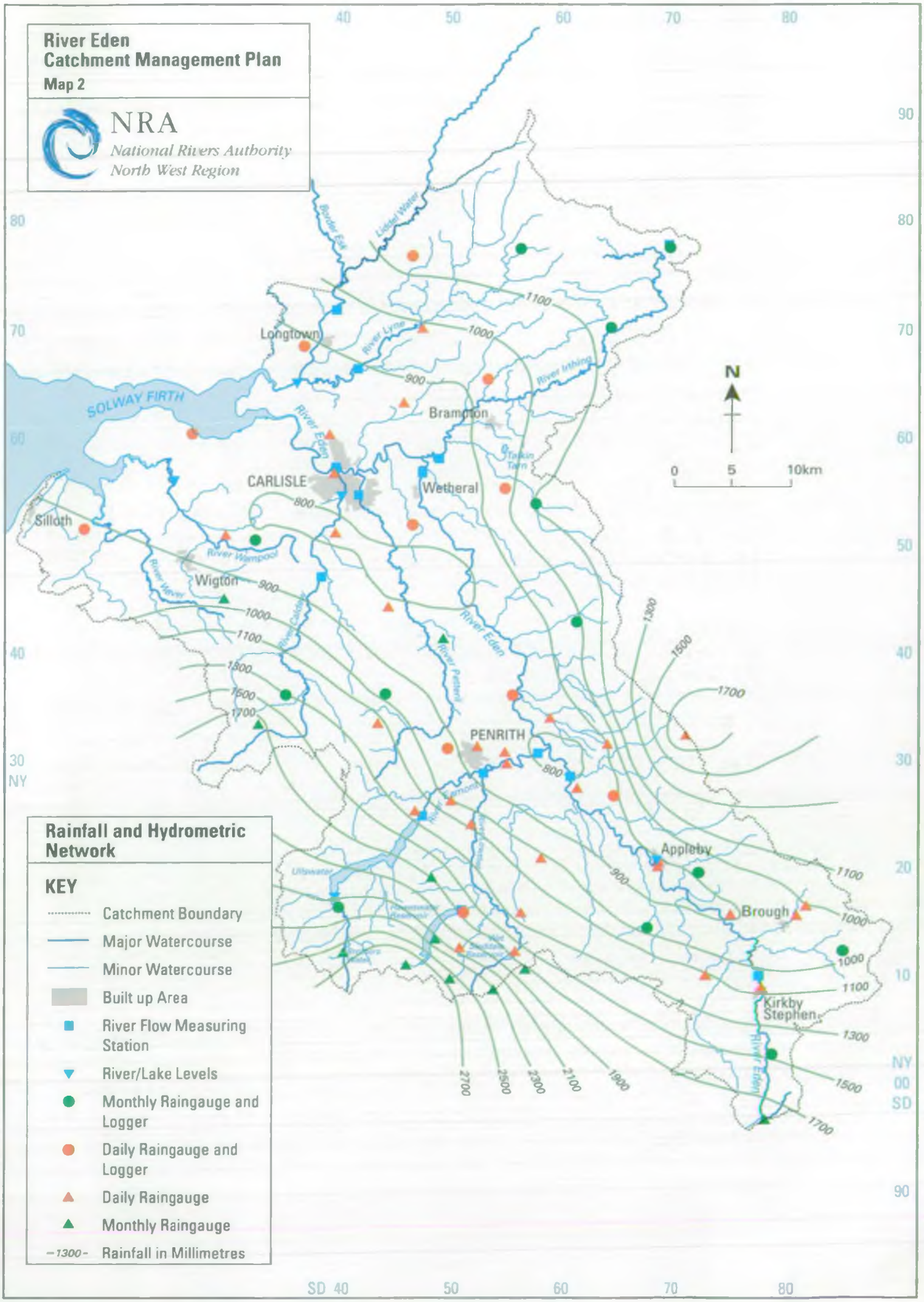
Run-off from these old rocks flows north and eastward on to a tract of Carboniferous Limestones (interbedded limestones, sandstones, shales and mudstones) which give rise to the familiar characteristics of limestone terrain. Groundwater can circulate within the fissure systems of the limestones, contributing to baseflow and supporting springs, some of which derive their flow from considerable distances.

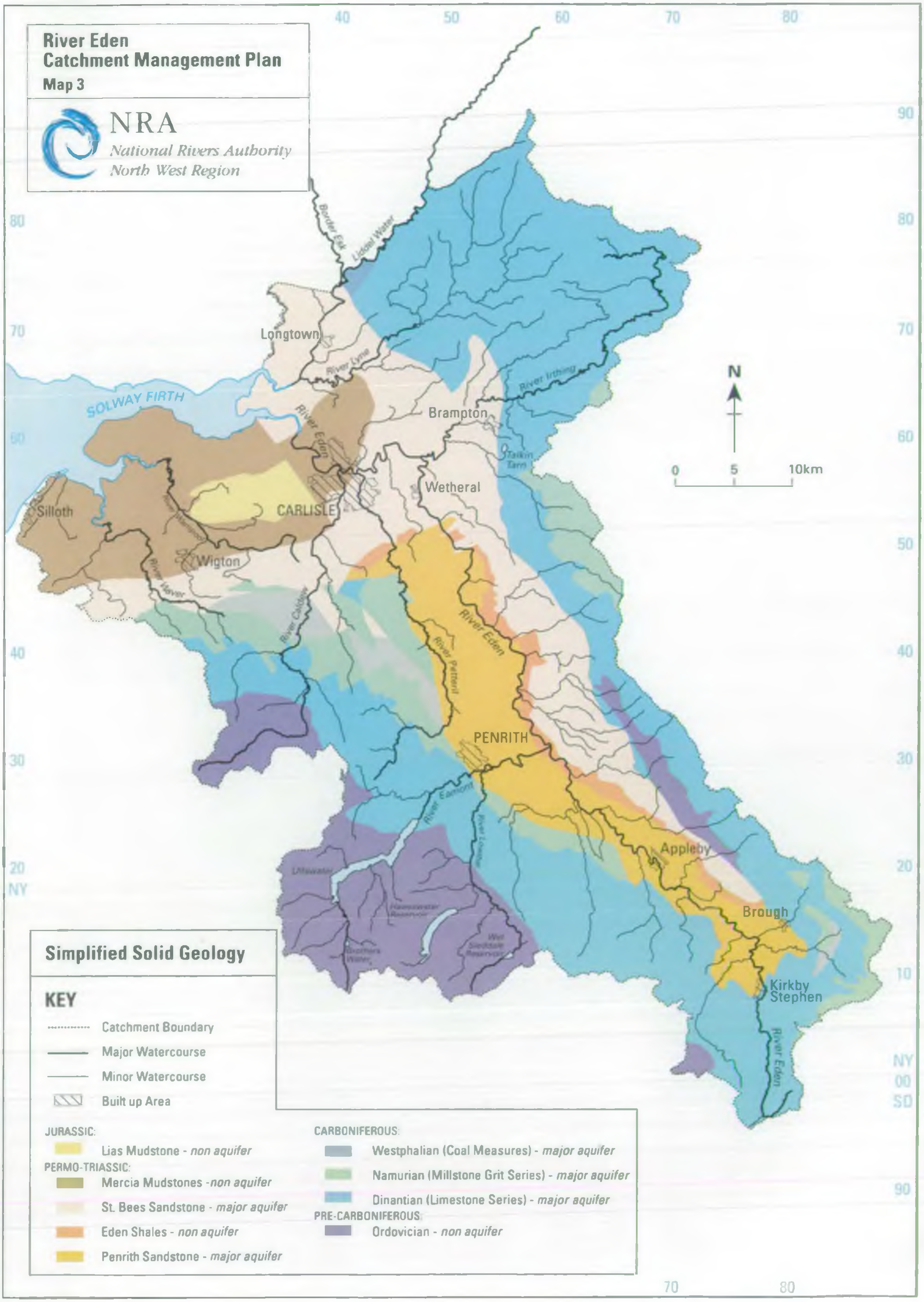
A narrow belt of younger Millstone Grit Series (Namurian) and Coal Measures (Westphalian) sandstones and mudstones extends north westwards from Appleby to form the lower slopes of the Eden Valley.

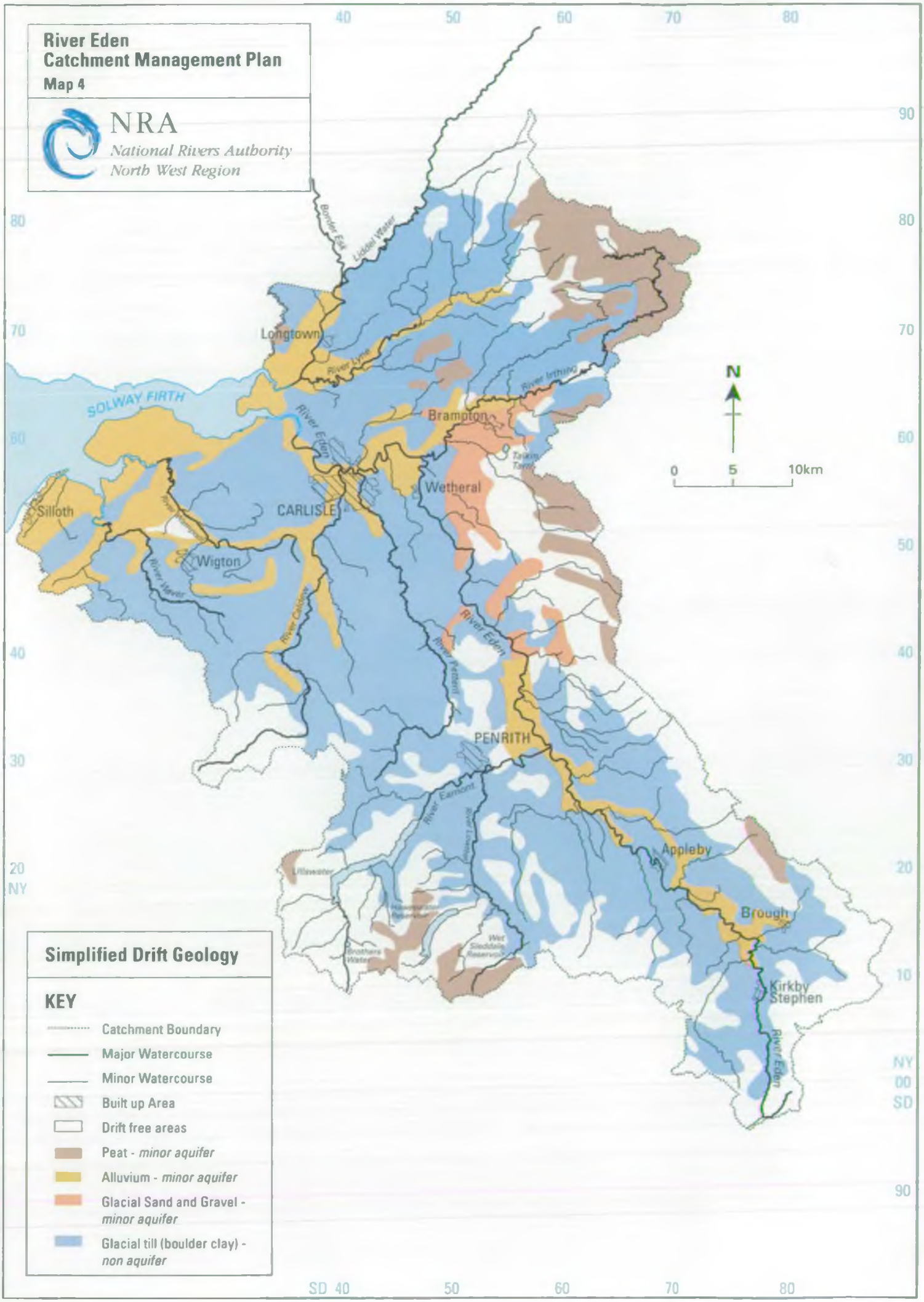
These Carboniferous rocks, which act as **minor aquifers** which are capable of supporting small scale abstractions, dip under the red Permo-Triassic rocks which floor the Eden Valley itself. The Permo-Trias is divided into two **major aquifers** by a narrow outcrop of Eden Shale, a low permeability deposit containing thick beds of gypsum and anhydrite deposits which are extensively quarried and mined.

To the west of the Eden Shale is the Penrith Sandstone of Permian age, a soft red sandstone of wind blown origin exhibiting large desert dunes which are well exposed around Appleby. The rounded grains result in porous rock with relatively high storage and permeability capable of supporting a number of large groundwater abstractions. The water table in this sandstone tends to be flat and laterally continuous providing significant baseflow to the River Eden.

To the east of the Eden Shale outcrop is the red St. Bees Sandstone of Triassic age. This is a much larger and lower permeability sandstone characterised by fissure flow and more steeply inclined water tables. It is nevertheless a moderately good aquifer and supports a few significant abstractions. Groundwaters support baseflow to the numerous streams which cross the outcrop and which take rapid run-off from the adjacent Pennines to the River Eden.


River Eden
Catchment Management Plan
Map 2
NRA
National Rivers Authority
North West Region
SOLWAY FIRTH
Longtown
Brampton
CARLISLE
Wetheral
Silloth
Wigton
PENRITH
Appleby
Brough
Kirkby Stephen
River Eden
River Lyne
River Irthing
River Wampool
River Caldew
River Petteril
River Eamont
Ullswater
Border Esk
Liddel Water
Talkin Tarn
N
0 5 10km
Rainfall and Hydrometric Network
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area
River Flow Measuring Station
River/Lake Levels
Monthly Raingauge and Logger
Daily Raingauge and Logger
Daily Raingauge
Monthly Raingauge
-1300- Rainfall in Millimetres
800
900
1000
1100
1300
1500
1700
1900
2100
2300
2500
2700
40
50
60
70
80
90
30
20
10
00
NY
SD


River Eden
Catchment Management Plan
Map 3
NRA
National Rivers Authority
North West Region
Simplified Solid Geology
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area
JURASSIC:
Lias Mudstone - non aquifer
PERMO-TRIASSIC:
Mercia Mudstones -non aquifer
St. Bees Sandstone - major aquifer
Eden Shales - non aquifer
Penrith Sandstone - major aquifer
CARBONIFEROUS:
Westphalian (Coal Measures) - major aquifer
Namurian (Millstone Grit Series) - major aquifer
Dinantian (Limestone Series) - major aquifer
PRE-CARBONIFEROUS:
Ordovician - non aquifer
N
0
5
10km
SOLWAY FIRTH
Longtown
Brampton
Wetheral
CARLISLE
Silloth
Wigton
PENRITH
Appleby
Brough
Kirkby Stephen
River Eden
River Lyne
River Irthing
River Caldew
River Petteril
River Eamont
River Lowther
River Waver
Border Esk
Liddel Water
Talkin Tarn
Ullswater
40
50
60
70
80
90
NY
00
SD


River Eden
Catchment Management Plan
Map 4
NRA
National Rivers Authority
North West Region
Simplified Drift Geology
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area
Drift free areas
Peat - minor aquifer
Alluvium - minor aquifer
Glacial Sand and Gravel - minor aquifer
Glacial till (boulder clay) - non aquifer
N
0
5
10km
SOLWAY FIRTH
Longtown
Brampton
Wetheral
CARLISLE
Silloth
Wigton
PENRITH
Appleby
Brough
Kirkby Stephen
River Eden
River Lyne
River Irthing
River Caldew
River Petteril
River Eamont
Lliswater
Border Esk
Liddel Water
SD 40
50
60
70
80
90
NY
00
10
20
30
40
50
60
70
80
90

A major boundary fault further to the east causes the Triassic rocks to abut against Carboniferous Limestone and some of the older rocks once again. The presence of hard igneous intrusions here, notably the Whin Sill, along with Millstone Grit cap rocks results in some of the highest parts of the Pennine range.

The youngest rocks within the Eden catchment occur in the north west, beneath the Rivers Waver, Wampool and lower reaches of the Eden. These comprise mudstones of Triassic and Jurassic age. They are generally impermeable and as such are classed as **non-aquifer.**

Much of the Eden Valley is covered in glacial drift. The thickest developments occur over the central flatter areas of the Penrith Sandstone and Eden Shales with boulder clays up to 20m deep. These drift deposits are locally important as protection to the aquifers and can effectively isolate some of the tributaries from the main water table.

In upland areas where drift cover is thin or absent the groundwaters will be particularly vulnerable to pollution from man's activity, principally agricultural practices.

3.0 USES AND TARGETS

This section of the consultation report looks at current uses of the catchment which affect or are likely to affect the water environment. Targets or objectives are then set for each use against which the current state of the catchment can be analysed.

This section of the plan will not be repeated in the action plan to be produced following consultation. Consequently comments received on this section will not be incorporated directly into the action plan although they will be taken on board for 5 year reviews of the Consultation Report.

3.1 WATER QUALITY

3.1.1 General

Water Quality plays a significant role in determining the variety of uses that a catchment can support. This section explains the criteria used to assess water quality within the catchment before looking at the uses in detail.

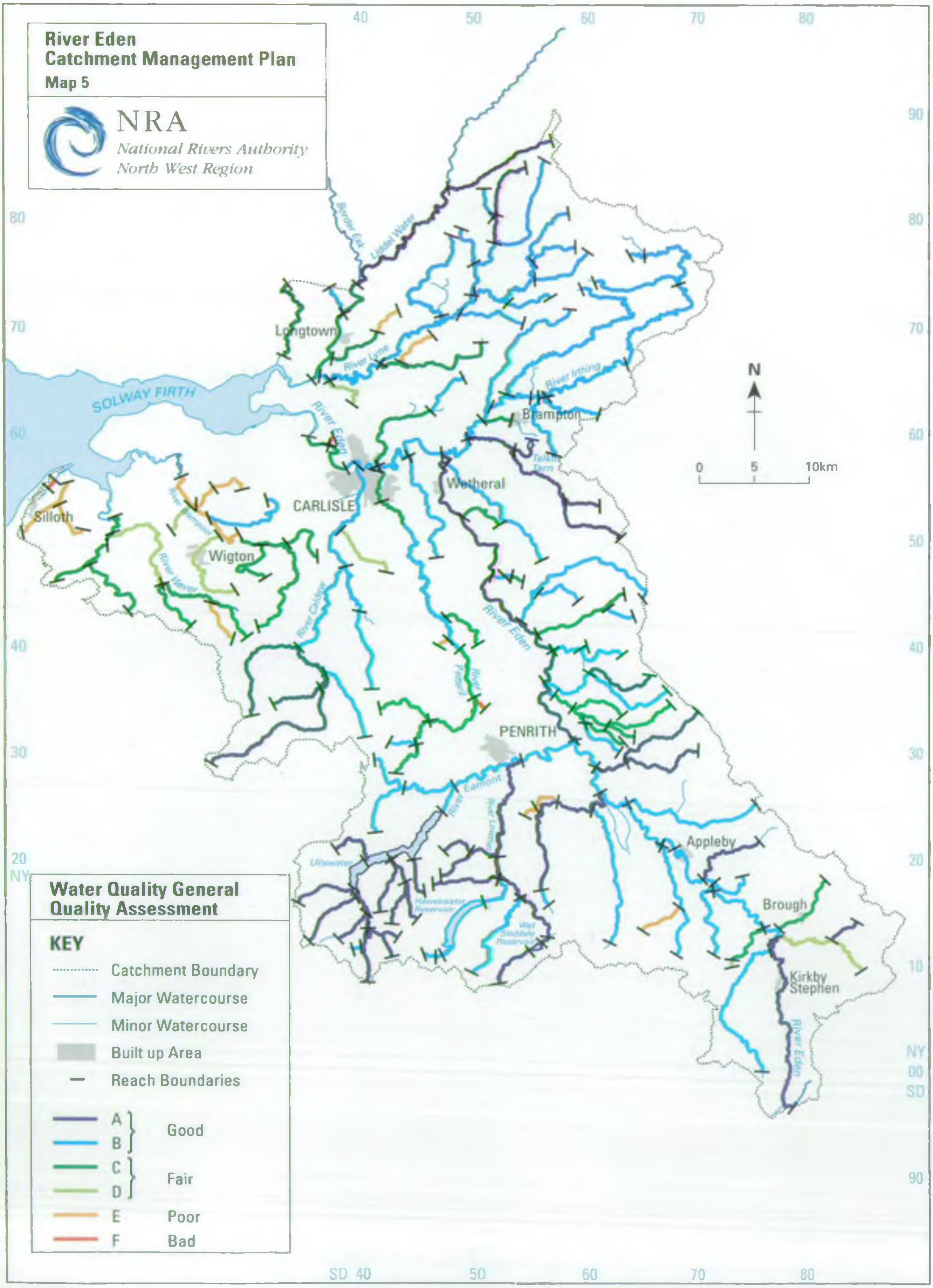
The NRA has a duty to monitor the extent of pollution in controlled waters. Controlled waters include rivers, streams, ditches, lakes, groundwaters, estuaries and coastal waters. This is achieved by chemical, biological and microbiological sampling programmes. Water quality information is available to the public and held on the Water Resources Act register at the NRA North West headquarters in Warrington.

3.1.2 General Quality Assessment and Statutory Water Quality Objectives

The NRA uses two principle schemes for the reporting and management of river water quality: the General Quality Assessment (GQA) scheme and the Statutory Water Quality Objectives (WQOs) scheme. These schemes have replaced the water quality classification system used previously (the NWC classification) by the NRA.

The GQA scheme is used to make periodic assessments of the quality of river water in order to monitor geographical and temporal trends. The scheme as presently envisaged will compromise four components - general chemistry, biology, nutrients and aesthetics - each providing a discrete "window" upon which the quality of river stretches is assessed. The general chemistry component of the GQA scheme is in current use, and compromises six tiered grades defined by standards for dissolved oxygen, BOD and total ammonia. The biology component is now developed and will be reported for 1995. The remaining two windows are still under development and will be applied when available.

The WQO scheme establishes clear quality targets to provide a commonly-agreed planning framework for regulatory bodies and dischargers alike. The proposed WQO scheme is based upon the recognised uses to which a river stretch may be put. These uses include: River Ecosystems; Special Ecosystem; Abstraction for Potable Supply; Agricultural/Industrial Abstraction; and watersports. The standard defining the five tiered River Ecosystem (RE) uses classes, which address the chemical quality requirements of different types of aquatic ecosystems, were introduced by *The Surface Waters (River Ecosystem) (Classification) regulations 1994*. (Standards for further uses are still under development.) For each stretch of river, a target RE class will be assigned, including a date by which this level of water quality should be achieved. Until WQOs are formally established by legal notice served by the Secretary of State, and therefore exist on a statutory basis, they will be applied on a non-statutory basis through a translation of River Quality Objectives (RQOs) from NWC classes to appropriate RE classes and target dates. RQOs were formulated by the former North West Water Authority in 1979, following a public consultation.


River Eden
Catchment Management Plan
Map 5
NRA
National Rivers Authority
North West Region
Water Quality General
Quality Assessment
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area
Reach Boundaries
A
B
Good
C
D
Fair
E
Poor
F
Bad
N
0
5
10km
SOLWAY FIRTH
Longtown
River Lyne
River Irthing
Brampton
Talkin Tarn
River Eden
CARLISLE
Wetheral
Silloth
Wigton
River Waver
River Caldew
River Petteril
River Eden
PENRITH
River Eamont
River Lowther
Ullswater
Haweswater Reservoir
Wet Sleddale Reservoir
Appleby
Brough
Kirkby Stephen
River Eden
Border Esk
Liddel Water
40
50
60
70
80
90
30
20
10
NY
00
SD
SD 40

The GQA and WQO schemes are initially being applied only to river and canals. Schemes for other controlled waters are also under development.

3.1.3 General Quality Assessment

Overview of water quality in the catchment (see map 5)

Every 5 years a national survey is carried out of the quality of rivers, canal and tidal waters in England and Wales. Key stretches (i.e. stretches receiving significant discharges or stretches of significant flow) are monitored at strategic sampling points. The last national survey was in 1990. .

A comparison of GQA classes based on chemical data for 1990 (using 1988-90 data) with those for 1993 (using 1991-1993 data) for rivers and canals in the Eden catchment is shown below (water quality criteria for the GQA classes is given in appendix 1).

GQA Class		km		%	
		1990	**1993**	**1990**	**1993**
A	Good	124.2	393.6	9.3	29.5
B	Good	326.1	640.8	24.4	48.0
C	Fair	26.0	173.2	1.9	13
D	Fair	34.03	50.5	2.6	3.8
E	Poor	12.9	47.1	1.0	3.5
F	Bad	1.2	3.6	0.1	0.3
Unclassified		810	26	60.7	1.9
TOTAL		**1334.7**	**1334.8**	**100.0**	**100**

In 1993, 77.5% of the length of the classified stretches in the Eden catchment is classified as water of good quality; 94.3% is classified as water of good to fair quality; and only 3.8% is classified as water of poorer quality. It should be noted that since 1990, due to increased monitoring, the total length of classified water in the catchment has increased.

Tidal waters and estuaries are presently still classified using the National Water Council (NWC) scheme (Appendix 2) which considers dissolved oxygen levels, aesthetic quality and biological quality and places water quality on one of four classes. Summary data for 1990 is shown in the following table.

Class		km	%
A	Good	64.2	90.8
B	Fair	4.7	6.6
C	Poor	1.8	2.6
D	Bad	0.0	0.0
TOTAL		70.7	100.0

The table shows that 90.8% of the length of the classified tidal waters in the Eden Catchment are of good quality; and 97.4% is classified as water of good to fair quality. Only 2.6% of the length of classified tidal waters are classified as water of poor quality and there are no classified stretches of bad water quality.

3.1.4 Water Quality Objectives

Water Quality Objectives have been considered in 2 ways:

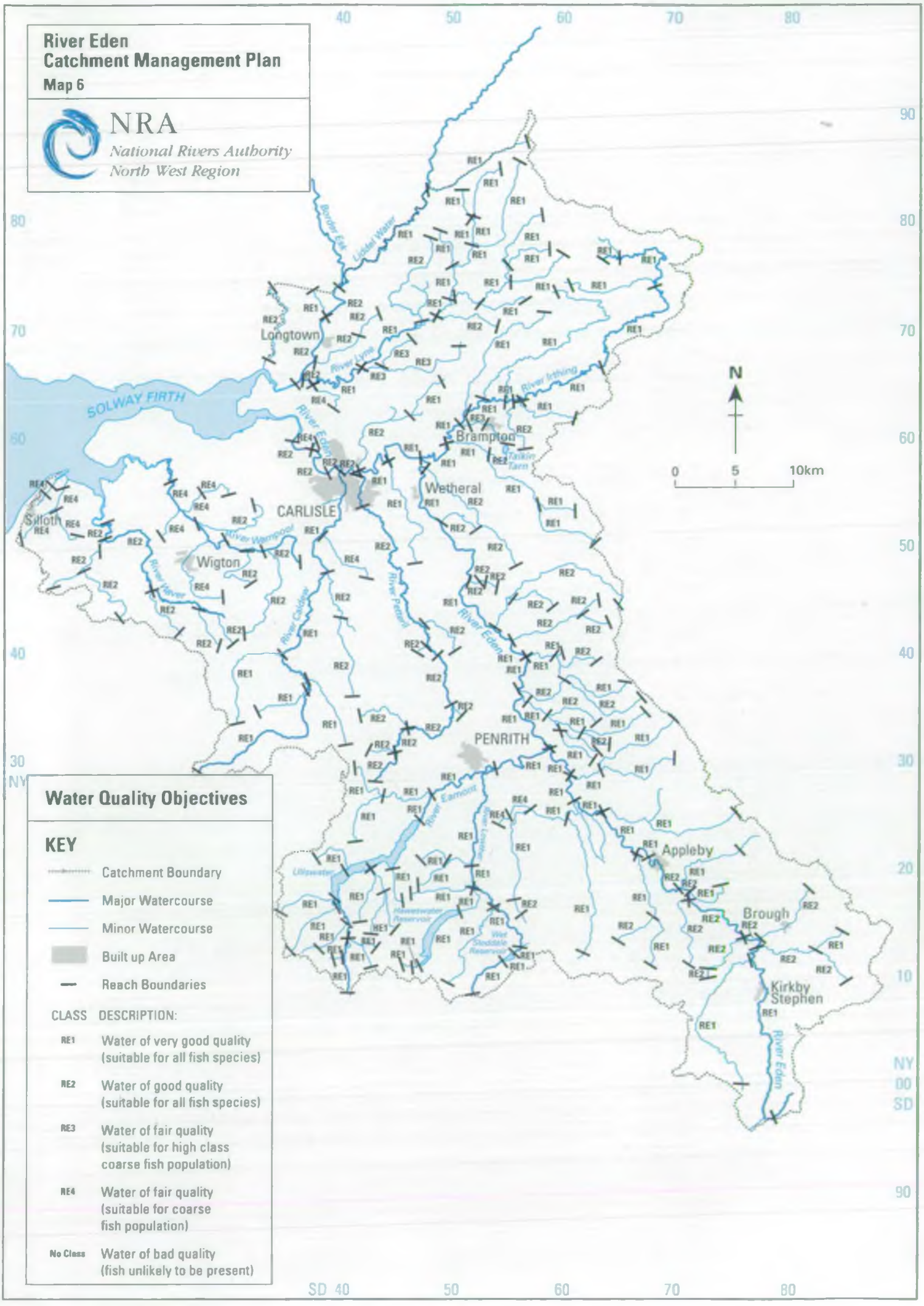
1) Use-related River Ecosystem targets.
2) Statutory EC Directives objectives.

Use-related River Ecosystem targets

Descriptions for the 5 Ecosystem Use classes are given below. The quality criteria from which these classes are derived is outlined in appendix 3.

Class	Description
RE1	Water of very good quality (suitable for all fish species)
RE2	Water of good quality (suitable for all fish species)
RE3	Water of fair quality (suitable for high class coarse fish populations)
RE4	Water of fair quality (suitable for coarse fish populations)
RE5	Water of poor quality (which is likely to limit coarse fish populations)
Waters not achieving class RE5 are of bad quality (in which fish are unlikely to be present)	

Every classified stretch in the Eden catchment has been set a River Ecosystem objective. These are comprised of a Rivers Ecosystem class and in order to prevent deterioration of present water quality RE objectives are immediately effective. These objectives have been incorporated into map 6 and are designated for the lifetime of the plan.


River Eden
Catchment Management Plan
Map 6
NRA
National Rivers Authority
North West Region
Water Quality Objectives
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area
Reach Boundaries
CLASS DESCRIPTION:
RE1 Water of very good quality (suitable for all fish species)
RE2 Water of good quality (suitable for all fish species)
RE3 Water of fair quality (suitable for high class coarse fish population)
RE4 Water of fair quality (suitable for coarse fish population)
No Class Water of bad quality (fish unlikely to be present)
SOLWAY FIRTH
CARLISLE
Longtown
Brampton
Wetheral
Silloth
Wigton
PENRITH
Appleby
Brough
Kirkby Stephen
River Eden
River Lyne
River Irthing
River Petteril
River Caldew
River Wampool
River Ellen
River Eamont
Border Esk
Liddel Water
Talkin Tarn
Ullswater
Haweswater Reservoir
Wet Sleddale Reservoir
N
0
5
10km
40
50
60
70
80
90
30
20
10
00
NY
SD

Although these objectives are non-statutory, they are presented here for informal consultation. When the Secretary of State introduces statutory WQOs, further formal consultation will take place. Once in force the NRA and the Secretary of State are under a duty to take steps to ensure that the requirements of the statutory WQOs are met.

Some of the current 5 year RE objectives which have been set for the lifetime of the plan are lower than a neutral translation of objectives from the old NWC scheme as shown in appendix 4 and 5.

Although it does not necessarily follow that there is a fully neutral translation between the NWC and Rivers Ecosystem classification scheme in all cases, for most stretches there is a degree, of compatibility as described below:

NWC Class	RE Class
1A	1
1B	2
2	3 or 4
3	5
4	

Appendix 4 lists stretches which were originally designated as Class 1A under the NWC scheme. However a target of class RE2 is considered to be more appropriate under the River Ecosystem classification scheme. Effectively all of these stretches remain of original class 1 quality which is reflective of high quality waters capable of supporting all fish species including salmon. Appendix 5 lists stretches which have been given revised RE targets which give a more accurate reflection of achievable water quality due to natural geographic conditions.

EC Directive Water Quality Objectives

The following EC Directives contain standards which have implications for water quality in the catchment:

1) The **Dangerous Substances Directive (76/464/EEC)** which is concerned with controlling pollution caused by discharges of certain substances considered harmful to the aquatic environment. The Directive established two lists of compounds. List 1 contains substances regarded as particularly dangerous because of their toxicity, persistence and bioaccumulation. Discharges of List I substances must be controlled by Environmental Quality Standards (EQSs) issued through Daughter Directives. List II contains substances which are considered to be less dangerous but which still have a deleterious effect on the aquatic environment. Discharges of List II substances are controlled by EQSs set by individual Member States.

2) The **Bathing Water Directive (76/160/EEC)** which sets Environmental Standards (EQSs) for designated bathing waters that are used for bathing. The objectives of the directive are to improve or maintain the quality of bathing water for amenity reasons and to protect public health. Although the NRA implement

the sampling and analysis pursuant to the Directive it does not have any responsibilities for public health.

The only designated bathing water within the Eden catchment is at Skinburness. This bathing water has complied with the Bathing Water Directive for 1993 and 1994 since an interceptor sewer for existing discharges has diverted flows to Silloth Sewage Treatment Works (STW).

3) The **Freshwater Fisheries Directive (78/659/EEC)** is concerned with ensuring that water quality in designated stretches of water is suitable for supporting fisheries. This Directive contains two sets of quality standards, one at levels to support a cyprinid fish population (ie coarse fish) and another set at stricter levels to support a salmonid fish population (eg salmon and trout). There are two sets of standards for each fishery type, imperative (I) standards, which must be achieved and guideline (G) standards which Member States should aim to achieve.

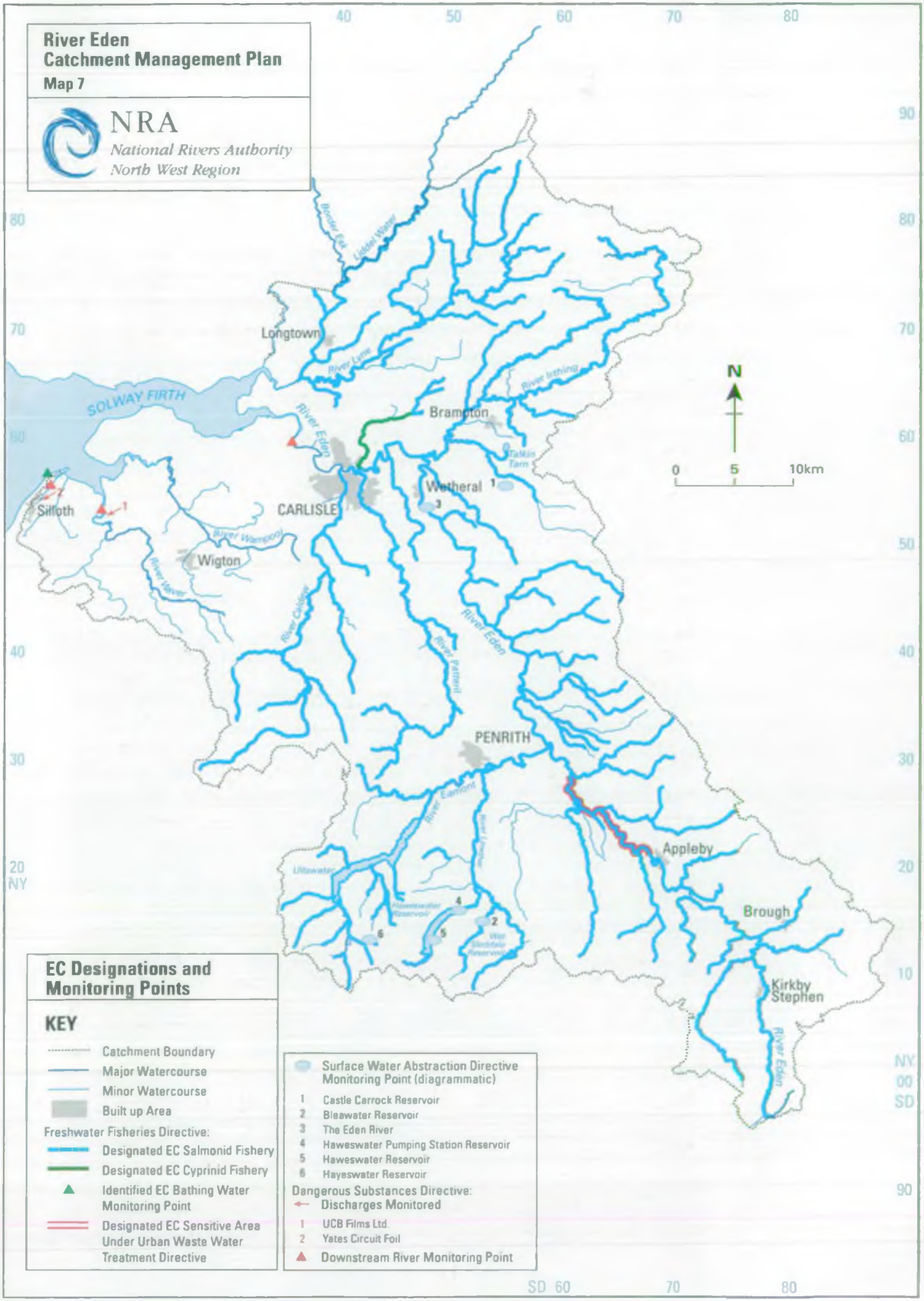
4) The **Surface Water Abstraction Directive (75/440/EEC)** ensures that surface water abstracted for use as drinking water meets certain standards and is given adequate treatment before entering public water supplies. The Directive sets out imperative standards which must be achieved, and guideline standards which Member States should aim to achieve, for water for public supply which is to be given different levels of treatment.

5) The **Urban waste Water Treatment Directive (91/271/EEC)** lays down minimum standards for the provision of sewerage collection systems and sewage treatment. The Directive specifies secondary treatment for all discharges serving population equivalents greater than 2000, but provides for higher standards of treatment for discharges to "sensitive "areas. Sensitive areas are those where waters are used for surface water abstractions for drinking water; where the nitrate concentration exceeds the standards in the Surface Water Abstraction Directive (75/440/EEC); where surface waters are or may become eutrophic in the near future; or where more stringent treatment is required to fulfil the requirements of other EC Directives. Discharges below a population of 2000 must also receive "appropriate" treatment as defined in a guidance note.

There are 2 identifiable stretches in the Eden catchment which are relevant to this Directive:

i) Stretches designated as sensitive areas: The river Eden from Appleby STW to Temple Sowerby has been identified as a sensitive area, on the basis of its eutorphic status. Monitoring data will be collected for this stretch to assist in assessing the effect of nutrient removal at Appleby STW in terms of the improvements it has on the water quality of the stretch. The nutrient of concern to this stretch is phosphorus and removal of this substance to the directive standards must be in place by 31st December, 1998, unless it can be demonstrated that nutrient removal will have no significant effect on the water quality of the stretch.

ii) Future proposed sensitive areas. The river Eamont from Penrith STW to the river Eden has been proposed as a suitable site for inclusion for designations in 1997. Monitoring data will be collected for this stretch to determine whether this


River Eden
Catchment Management Plan
Map 7
NRA
National Rivers Authority
North West Region
SOLWAY FIRTH
Longtown
Brampton
Wetheral
CARLISLE
Silloth
Wigton
PENRITH
Appleby
Brough
Kirkby Stephen
River Eden
River Lyne
River Irthing
River Petteril
River Caldew
River Waver
River Wampool
River Eamont
Ullswater
Haweswater Reservoir
Wet Sleddale Reservoir
N
0
5
10km
EC Designations and Monitoring Points
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area
Freshwater Fisheries Directive:
Designated EC Salmonid Fishery
Designated EC Cyprinid Fishery
Identified EC Bathing Water Monitoring Point
Designated EC Sensitive Area Under Urban Waste Water Treatment Directive
Surface Water Abstraction Directive Monitoring Point (diagrammatic)
1 Castle Carrock Reservoir
2 Bleawater Reservoir
3 The Eden River
4 Haweswater Pumping Station Reservoir
5 Haweswater Reservoir
6 Hayeswater Reservoir
Dangerous Substances Directive:
Discharges Monitored
1 UCB Films Ltd.
2 Yates Circuit Foil
Downstream River Monitoring Point

site meets the criteria set by the Department of the Environment (DoE) to allow it to be designated as a sensitive area. For an area to be defined as 'less' sensitive, discharges must not adversely affect the environment. Good water exchange is necessary, with no eutrophication or oxygen depletion. There are no designated 'less' sensitive areas in the Eden catchment.

Map 7 show the EC Directive monitoring points and designated areas for the Eden Catchment.

3.1.5 State of the Catchment

General

Having set River Ecosystem (RE) targets it is now possible to assess the current state of the catchment against these targets. The assessment has been made using the chemical analytical data from the designated GQA sites. A three year period (1991 - 1993 calendar years) has been used to assess compliance with RE targets. The error involved in sampling has been considered and statistical confidence limits calculated for the water quality data.

The state of the catchment in terms of compliance with Rivers Ecosystem targets and also EC Directive Objectives is shown in map 8.

Failures to meet Targets and Issues Arising

Two types of failures to meet objectives have been considered in this plan:

1) Failures to meet River Ecosystem targets
2) Failures to comply with EC Directives

Failure to meet these objectives have been grouped under the following headings:

1) Impact of Leachate from Landfill sites

Leachate originating from Upper Flusco quarry landfill site is causing a failure to meet EC Freshwater Fish Directive Standards at Greystoke on the River Petteril (NGR: NY 445 311). This failure has been identified as an issue and is discussed in section 4.2.9.

2) Impact of industrial discharges

Industrial discharges are responsible for failure of water quality objectives at 2 locations. The first location is a classified RE stretch from Silloth Aerodrome to the freshwater limit at Skinburness Rd. This stretch currently has an RE class of 5 and is significantly failing to meet its RE target class of 4. The stretch at its downstream limit also fails to meet EQS for dissolved copper under the EC Dangerous Substances Directive. Failure to meet these objectives is due to contaminated surface water from a company that has now no treatment processes on the site. The company is Belgian-based and the Authority has secured certain understandings from the company. The company will be held responsible for site

contamination and if the site is sold in the future the company will undertake an environmental assessment and undertake measures to decontaminate the affected areas as appropriate.

The second location on the waver Estuary opposite Red Flatt (NGR: NY 176 531) which fails to meet the EQS for pH under the EC Dangerous Substances Directive. This is due to a company engaged in the manufacture of cellophane film and is discussed as an issue on section 4.2.14.

3) Impact of tidal waters impinging on fresh water standards.

Two stretches are failing to meet RE targets due to the sample point being influenced by tidal waters impinging on fresh water standards. These sites are:

i) Causeway head (Wath) Beck from Wolsty to the Fresh Water Limit (NGR: NY 1030 5050 to NY 1400 5510

ii) Blea Gutter from Abbey Cowper to Causeway Head Beck (NY 1530 5050 to NY 1331 5339). These sample points will be moved upstream to reflect fresh water quality. Monitoring data over a minimum duration of one calendar year is required for assessment to meet quality objectives, thus these 2 sites will be expected to meet their RE target class of 4 by January, 1997.

4) Impact of farming activity

Failures to meet RE targets due to farming activity occurs for two classified stretches:

i) Bampton Beck from Little Bampton STW to Wampool (NGR: NY 2700 5480 to NY 2502 5309)

ii) Bampton Beck from Park House to Little Bampton STW (NGR: NY 2930 5470 to NY 2700 5480)

This is discussed as an issue in section 4.2.12.

5) Impact of NWW Ltd Sewage Treatment Works (STW)

The impact of discharges from NWW Ltd Sewage Treatment Works influence non-compliance with RE targets for two classified stretches:

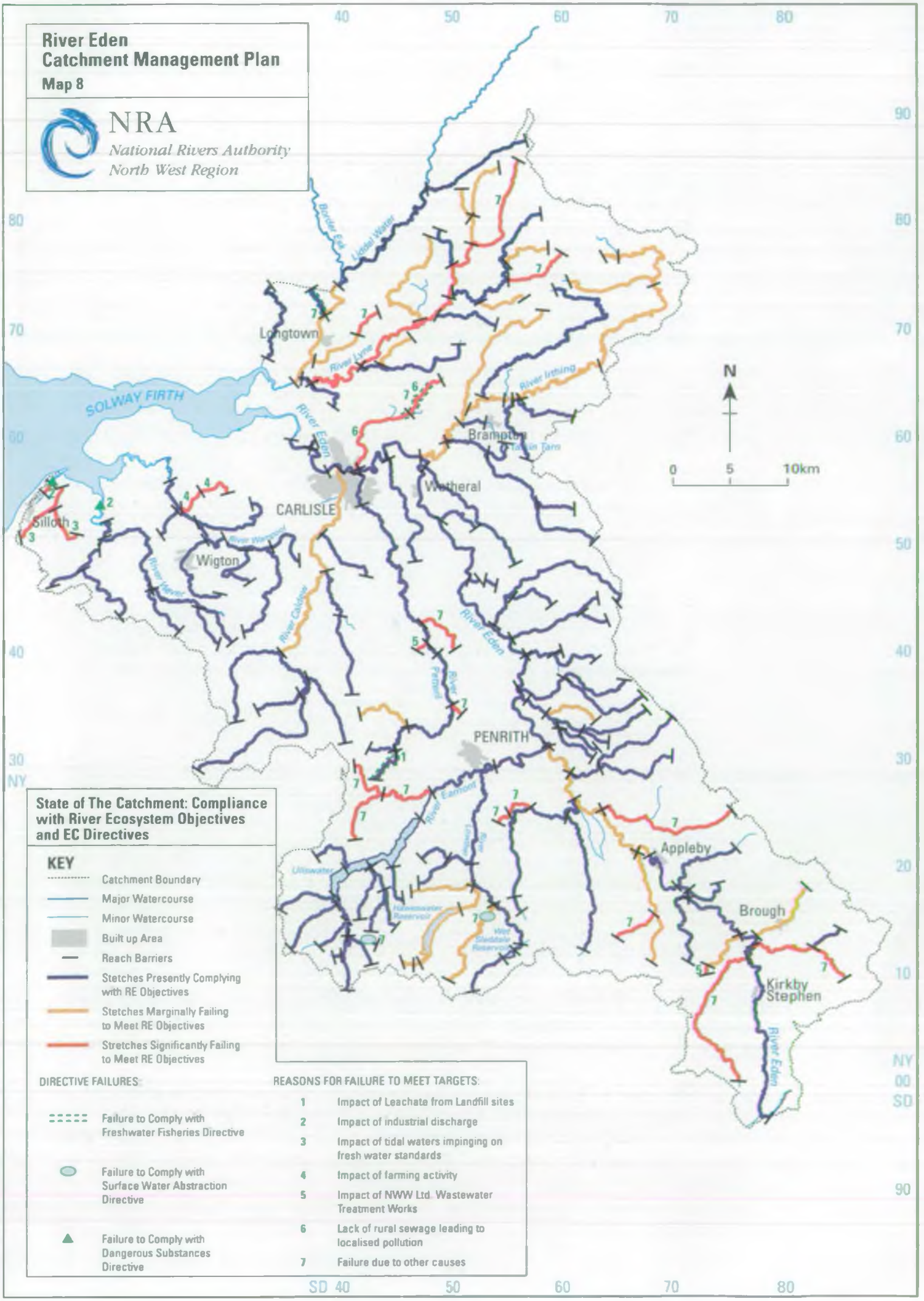
i) Calthwaite Beck from Calthwaite STW to the river Petteril (NGR: NY 4690 4020 to NY 4740 4070. Calthwaite STW is undergoing improvements scheduled in NWW current investment programme and is due to be completed by 2005.

ii) Blind Beck from Crosby Garrett (NGR: NY 7290 0970 to NGR: NY 7257 1050). New works have been completed at Crosby Garrett STW. Improvements are expected in the quality of discharges from the works and compliance with RE class 2 is anticipated by January 1997.

River Eden Catchment Management Plan

Map 8

NRA
National Rivers Authority
North West Region



State of The Catchment: Compliance with River Ecosystem Objectives and EC Directives

KEY

- Catchment Boundary
- Major Watercourse
- Minor Watercourse
- Built up Area
- Reach Barriers
- Stetches Presently Complying with RE Objectives
- Stetches Marginally Failing to Meet RE Objectives
- Stretches Significantly Failing to Meet RE Objectives

DIRECTIVE FAILURES:

- Failure to Comply with Freshwater Fisheries Directive
- Failure to Comply with Surface Water Abstraction Directive
- Failure to Comply with Dangerous Substances Directive

REASONS FOR FAILURE TO MEET TARGETS:

1. Impact of Leachate from Landfill sites
2. Impact of industrial discharge
3. Impact of tidal waters impinging on fresh water standards
4. Impact of farming activity
5. Impact of NWW Ltd. Wastewater Treatment Works
6. Lack of rural sewage leading to localised pollution
7. Failure due to other causes

6) Lack of rural sewerage leading to localised pollution

The lack of rural sewerage leading to localised pollution contributes to the failure of RE targets for two classified stretches:

i) Brunstock Beck from Highberries Beck to the river Eden (NGR: NY 4600 6190 to NY 4130 5690).
ii) Highberries Beck from Glebe to Brunstock Beck (NGR: NY 4880 6500 to NY 4600 6190) These failures to meet water quality objectives are discussed as an issue in section 4.2.13.

7) Failures due to other causes

Significant failures due to unknown causes can be put into 2 groups; those where there is non-compliance with quality objectives due to atypical results in the 3 year data set; and those where the cause of non-compliance with quality objectives is unknown and the stretches of concern are to be subjects of strict audit and investigation.

The following stretches display non-compliance with the RE target due to atypical results in the data set:

Rivers Name	Stretch Name	Upstream NGR	Downstream NGR	Current RE Class	RE Target
Blackrack Beck	QSL at Pears Gill to Petteril	NY 4980 4020	NY 4680 4250	5	2
Stoney Beck	QSL Greengill Foot to Petteril	NY 5130 3320	NY 4980 3490	5	2
Dacre Beck	QSL at Ulcat Row to Eamont	NY 4104 2225	NY 4786 2665	2	1
Skitwath Beck	QSL Berrier End to Dacre Beck	NY 4100 2920	NY 4349 2654	2	1
Trout Beck	QSL at Gasdale Head to Eden	NY 7460 2340	NY 6334 2512	2	1
Scandal Beck	QSL Scandal Head to Eden	NY 7570 0000	NY 7656 1125	2	1
Black Lyne	QSL at Glen Dhu to White Lyne	NY 5640 8550	NY 3700 6480	2	1
Kirk Beck	QSL Bullcleugh Gate to White Lyne	NY 5960 7670	NY 5491 7451	2	1

These atypical results are not reflective of the general water quality of the stretch and the RE target remains higher to prevent any deterioration of quality for other determinands.

In addition to these classified stretches non-compliance due to atypical results occur for the Freshwater Fish Directive and the Surface Water Abstraction Directive as follows:-

i) Freshwater Fish Directive

Glenzier Burn prior to the confluence with the river Esk (NGR: NY 380 715) and a tributary of Brunstock Beck at Fordsyke (NGR: NY 458 632) both failed to meet the EQS for dissolved oxygen due to atypical results. Both these stretches afford high water quality and the reasons for these failures remains unknown.

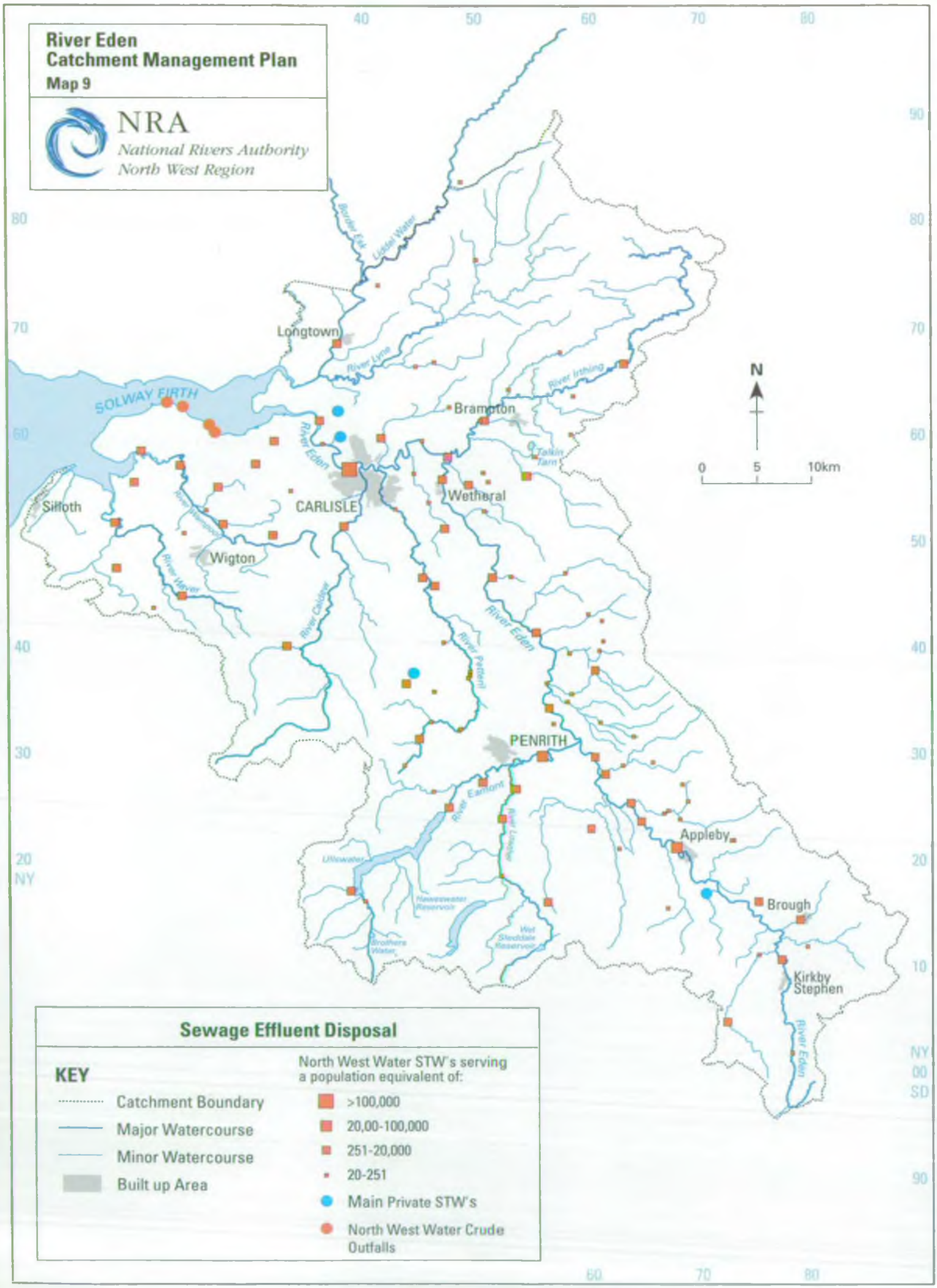
ii) Surface Water Abstraction Directive

Bleawater sampled from Swindale Water Treatment Works(WTW) (NGR: NY 525 147 and Hayeswater sampled from Hayeswater WTW (NGR: NY 422 130) both failed to meet the EQS for copper on one occasion under the Surface water Abstraction Directive. Although the results exceeded the specified standard, the results are considered to be atypical and not reflective of a water quality problem associated with abstraction at these sites.

The following stretches show significant non-compliance due to unknown causes.

Rivers Name	Stretch Name	Upstream NGR	Downstream NGR	Current RE Class	RE Target
Noonhowe Syke	NY 5500 2470 to Leith	NY 5500 2470	NY 5690 2530	5	4
Noonhowe Syke	QSL at NY 5400 2380 to NY 5500 2470	NY 5395 2395	NY 5500 2470	5	4
Scale Beck	QSL Gaythorne Hall to Hoff Beck	NY 6485 1330	NY 6814 1535	5	2
Belah	QSL at Wrenside to Eden	NY 8480 0950	NY 7701 1241	5	2
Hobbies (Hall) Burn	QSL Arthuret to Dry Beck	NY 4300 7140	NY 4124 6923	4	2

These sites will be subject to investigation and audit to assess the reasons for non compliance and propose options for action.


River Eden
Catchment Management Plan
Map 9
NRA
National Rivers Authority
North West Region
Longtown
SOLWAY FIRTH
Silloth
CARLISLE
Wigton
Brampton
Wetheral
PENRITH
Appleby
Brough
Kirkby Stephen
River Eden
River Lyne
River Irthing
River Caldew
River Petteril
River Eamont
Ullswater
N
0
5
10km
Sewage Effluent Disposal
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area
North West Water STW's serving a population equivalent of:
>100,000
20,00-100,000
251-20,000
20-251
Main Private STW's
North West Water Crude Outfalls

3.2 EFFLUENT DISPOSAL (SEE MAPS 9 AND 10)

3.2.1 General

This use relates to the disposal of domestic and industrial effluent to the water environment. Discharges of sewage or trade effluent to surface waters require the consent of the NRA. When determining consent applications the NRA will set appropriate conditions to protect other uses of the receiving water. In some cases the NRA inherited consents set by predecessor bodies which do not adequately protect other water uses. These are progressively being addressed within the prevailing restrictions, particularly on water company expenditure.

Water company expenditure during the period 1995-2000 has been structured around an "Index of Obligations" jointly agreed by the Department of the Environment (DOE), the Water Services Association (WSA), the Office of Water Services (OFWAT) and NRA. Priority has been given to meeting existing and new EC and domestic statutory obligations principally Directives concerned with Bathing Waters, Urban Wastewater Treatment and Freshwater Fish. The targeting of the majority of water company expenditure is therefore dictated by Nationally agreed obligations and priorities.

For certain prescribed industrial processes discharges are authorised by Her Majesty's Inspectorate of pollution (HMIP) in close consultation with the NRA. Within this framework the NRA will seek to ensure that authorisations protect the uses of the receiving water and aim to eliminate the discharge of dangerous substances in line with NRA consenting policy.

3.2.2 Local Perspective

Continuous Effluent

The major discharger in the catchment is North West Water Ltd. (NWW) who operate 112 sewage treatment works (STW's).

By far the majority of these works are small treatment plants serving small rural communities often comprimising of only a few houses (see map 9).

Flows to STWs are predominantly of domestic sewage, with the exception of Appleby where a local cheese factory contributes significantly to the loading of the works. This has led to NWW having difficulty in achieving consistent consent compliance particularly with regard to suspended solids.

The majority of NWW STW's in the catchment do not make significant impacts on their receiving watercourse. The exceptions are Calthwaite and in the recent past Crosby Garrett STW's. At Crosby Garrett a new STW has recently been commissioned incorporating secondary treatment and a new outfall to an area of greater dilution. It is anticipated that this will lead to water quality improvements in Blind Beck.

Calthwaite STW will be upgraded under the provisions of the EC Urban Wastewater Treatment Directive but this may not be before 2005.

There are four discharges of untreated sewage to the Eden estuary serving the coastal villages of Bowness-on-Solway, Glasson, Drumburgh and Port Carlisle. These do not cause significant problems, but will be upgraded to "appropriate treatment" by 2005 under the provisions of the Urban Wastewater Treatment Directive.

There are also a small number of private sewage treatment works in the catchment which in general do not cause significant problems. Because of the rural nature of the catchment large areas are not sewered and here septic tanks serving individual or small groups of properties are common place. Individually, such arrangements do not normally cause significant pollution. Groups of septic tanks in a restricted area cause occasional problems in parts of the catchment, for example around Crosby Ravensworth, Maulds Meaburn, Sandford and Aikton.

As a result of a long standing policy of encouraging the discharge of industrial effluent to sewer there are only a limited number of consented trade effluent discharges to watercourses (see map 10). The majority of these are fish farm effluents or discharges from mineral workings.

The UCB Films factory at Wigton discharges trade effluent down a long pipe to the Waver Estuary. Despite recent improvements in effluent treatment, biological activity in this pipeline is leading to septicity at the outfall.

Intermittent Discharges

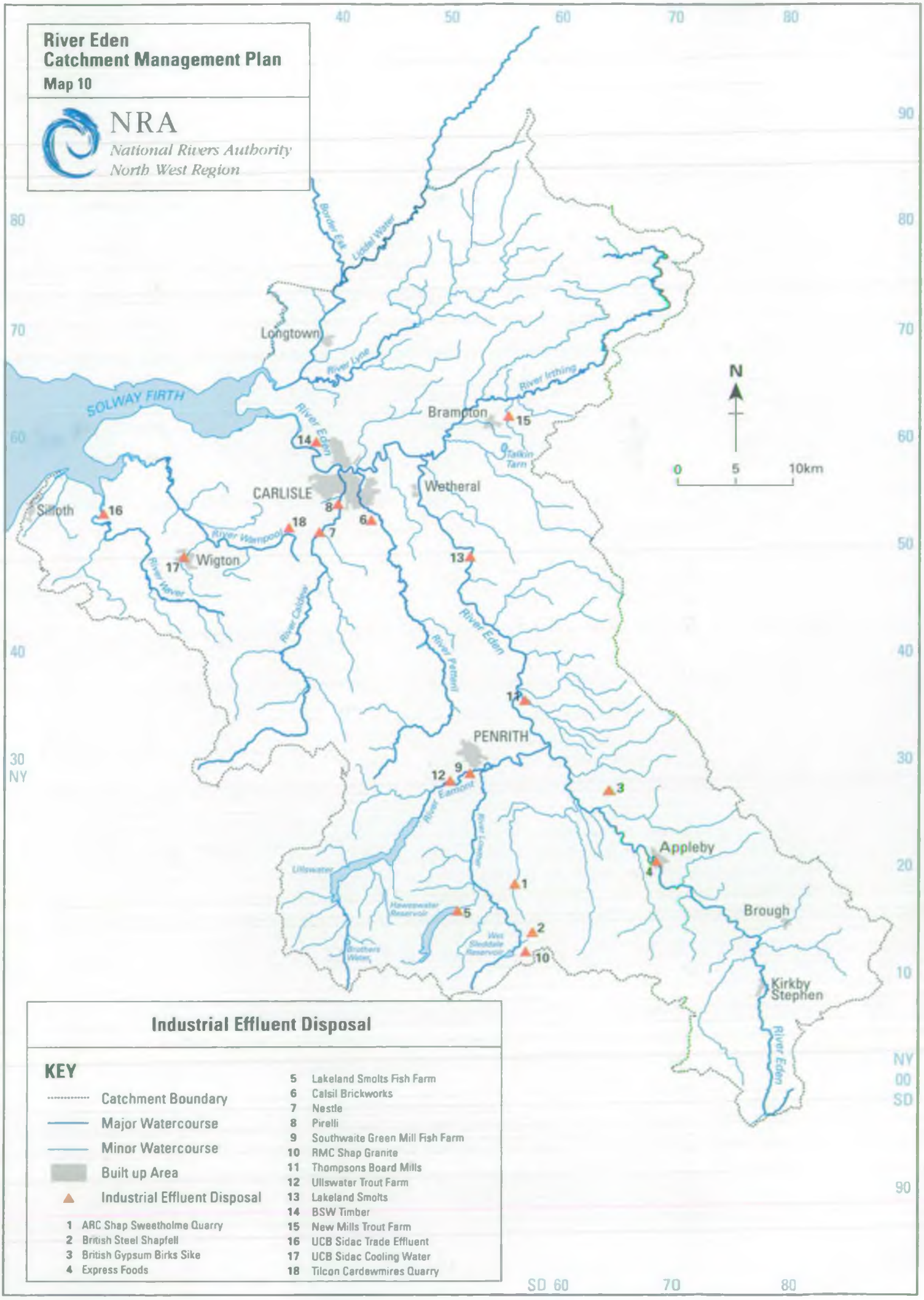
Combined sewer and sewage pumping station overflows occur on most sewerage systems in the catchment. These are subject to NRA consents which aim to limit the frequency of discharge to occasions of heavy rainfall when adequate dilution is available in the receiving watercourse.

Some overflows particularly on older systems discharge at more than an acceptable frequency. The discharge of sewage solids from overflows can also cause nuisance or offence.

There are 136 combined sewer overflows on the catchment of which 33 are unsatisfactory. Within the 10 year period to 2005, 4 of these unsatisfactory overflows are due to be improved by NWW.

Surface water drainage from industrial estates/premises often discharge direct to a watercourse. These drains can become contaminated by spillages, cross connections and inappropriate working practices leading to intermittent pollution, especially by oil.

Gilwilly industrial estate at Penrith and Rosehill at Carlisle have been problematic in this respect. Kingstown industrial estate in Carlisle has installed a communal oil interceptor and now pumps dry weather flows to foul sewer to reduce contamination of Cargo Beck.


River Eden
Catchment Management Plan
Map 10
NRA
National Rivers Authority
North West Region
SOLWAY FIRTH
Longtown
Border Esk
Liddel Water
River Lyne
River Irthing
Brampton
15
14
River Eden
Talkin Tarn
CARLISLE
Wetheral
Silloth
16
8
6
18
7
River Wampool
Wigton
17
13
River Waver
River Caldew
River Petteril
River Eden
12
PENRITH
9
12
River Eamont
3
Appleby
4
River Lowther
Ullswater
1
Haweswater Reservoir
5
Brothers Water
West Sleddale Reservoir
2
10
Brough
Kirkby Stephen
River Eden
N
0
5
10km
40
50
60
70
80
90
30
NY
SD
00
Industrial Effluent Disposal
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area
Industrial Effluent Disposal
1 ARC Shap Sweetholme Quarry
2 British Steel Shapfell
3 British Gypsum Birks Sike
4 Express Foods
5 Lakeland Smolts Fish Farm
6 Calsil Brickworks
7 Nestle
8 Pirelli
9 Southwaite Green Mill Fish Farm
10 RMC Shap Granite
11 Thompsons Board Mills
12 Ullswater Trout Farm
13 Lakeland Smolts
14 BSW Timber
15 New Mills Trout Farm
16 UCB Sidac Trade Effluent
17 UCB Sidac Cooling Water
18 Tilcon Cardewmires Quarry

3.2.3 Effluent Disposal Objectives

To control the discharge of effluents to ensure water quality objectives are met and other uses are not compromised.

Environmental requirements

Water Quality - No deterioration in upstream quality beyond that assumed in setting consent standards.

Water Quantity - No significant reduction in river flow beyond that assumed in setting consent standards.

Physical Features - Outfalls should be sited so as to achieve an adequate mixing regime and to minimise aesthetic and ecological impact.

The following issues relating to this "use" of the catchment can be found in Section 4 of the plan.

4.2.9 Failure to meet EC Freshwater Fisheries Directive standards in the River Petterill.
4.2.10 Pollution of a ditch by sewage at Sandford.
4.2.11 Impact of discharges from combined sewerage systems.
4.2.12 Pollution caused by farm effluent.
4.2.13 Lack of rural sewerage leading to localised pollution.
4.2.14 Impact of UCB Films Trade Effluent discharge.

3.3 FISHERIES

3.3.1 General

This use relates to the conservation of wild populations of fish and their habitats, recreational fishing for game and coarse fish and commercial fishing for salmon and sea trout.

The NRA has a duty under the Water Resources Act 1991 to maintain, improve and develop salmon, trout, freshwater fish and eel fisheries under its jurisdiction.

3.3.2 Local Perspective

210 km of the Border Esk and 926 km of the River Eden are designated as salmonid waters under the EC Freshwater Fisheries Directive.

This Directive is concerned with ensuring water quality in designated stretches of water is suitable for supporting fisheries. The NRA is responsible for monitoring and ensuring compliance with the Directive.

The catchment supports first class salmon and sea trout fisheries in both the Eden and Border Esk, with the latter being renowned for the quality of its sea trout fishing. The Liddle and Lyne support significant fisheries for salmon and sea trout. Declared catch returns for the various rivers in the catchment are shown in Appendix 6.

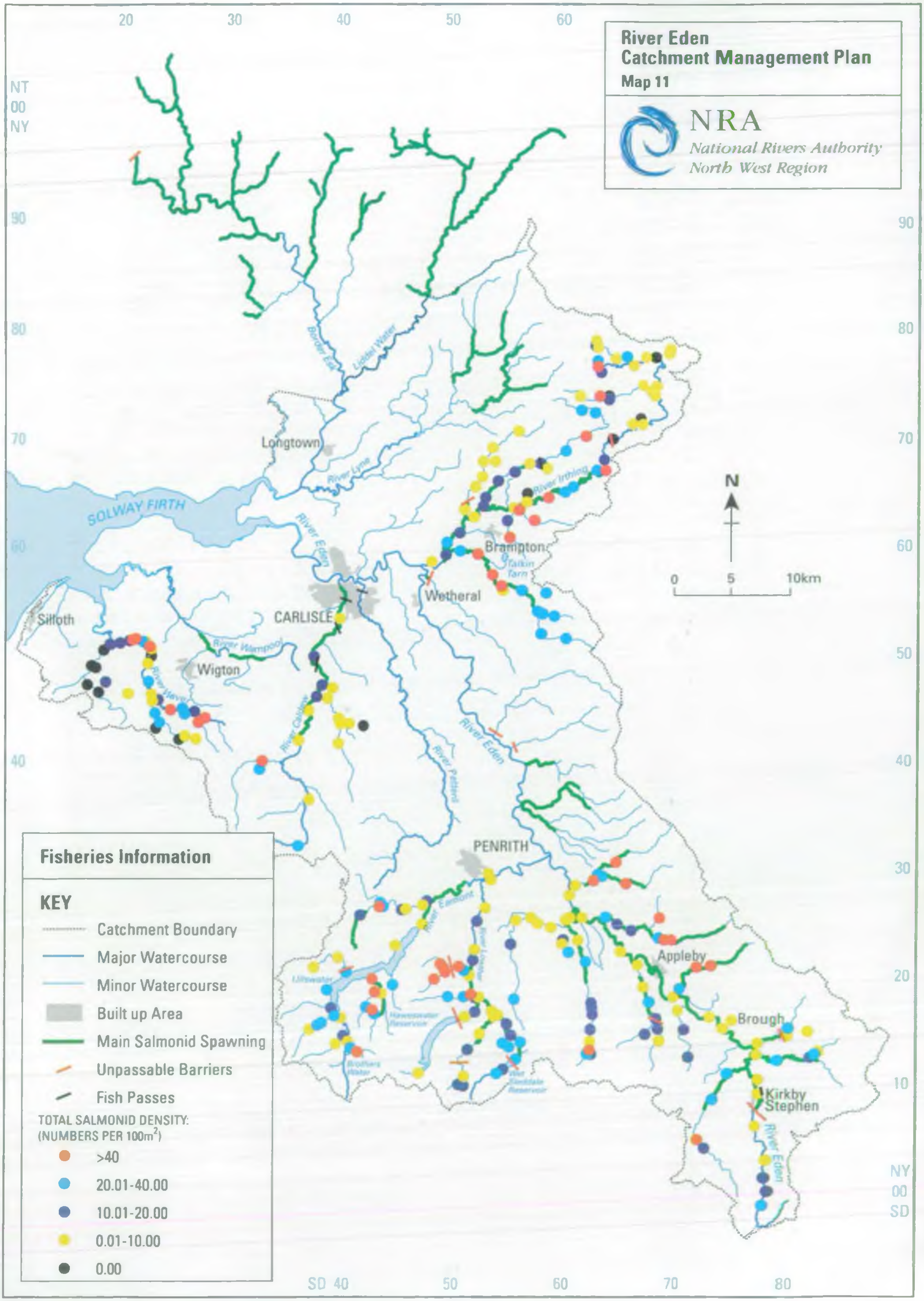
Brown trout are found throughout both systems with the Eden and its tributaries having some of the finest brown trout fishing in the country.

Charr are found in Haweswater and Schelly are present in Ullswater, Haweswater, Brotherswater and Red Tarn (Helvellyn). The Schelly is listed as a protected species under the Wildlife and Countryside Act 1981.

Dace, chub and grayling are found throughout the catchment. A decline in stocks has occurred over recent years, particularly dace and chub and the NRA are in the process of carrying out extensive investigations with the aim of improving stocks overall.

Several tarns, small lakes and ponds in the catchment have good coarse fisheries, with perch present in Ullswater, Brotherswater and Talkin Tarn. Pike are also found in many locations. Crofton Lake near Thursby has been developed recently and is producing reasonable catches of coarse fish. There are also 5 commercial put and take trout fisheries in the catchment.

The catchment has a large Haaf net fishery in the estuaries of both the Eden and Border Esk. The NRA issues 165 licences for Haaf netting every year. This is subject to review in 1996. Declared catch returns are shown in Appendix 7.



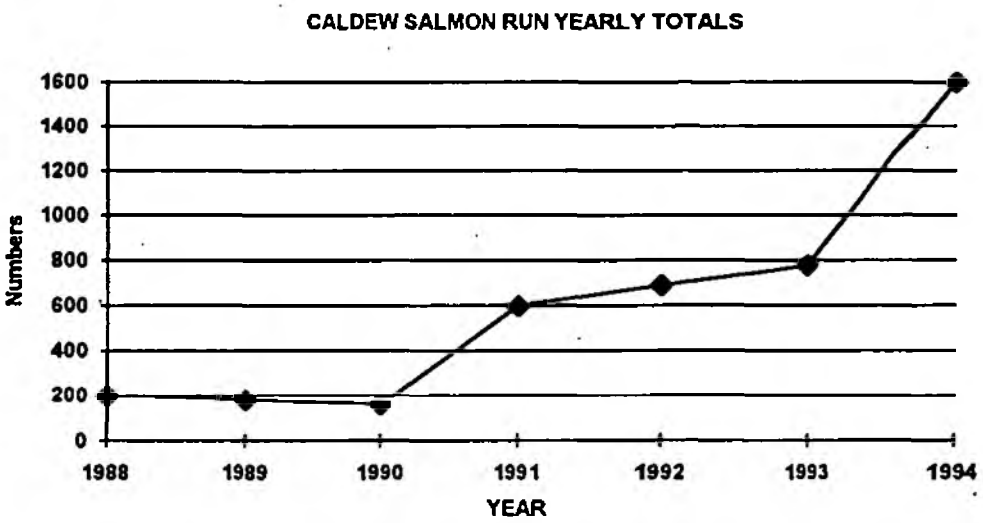
River Eden
Catchment Management Plan
Map 11
NRA
National Rivers Authority
North West Region
Fisheries Information
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area
Main Salmonid Spawning
Unpassable Barriers
Fish Passes
TOTAL SALMONID DENSITY:
(NUMBERS PER 100m²)
>40
20.01-40.00
10.01-20.00
0.01-10.00
0.00
SOLWAY FIRTH
Longtown
River Lyne
Border Esk
Liddel Water
River Irthing
Brampton
Talkin Tarn
Wetheral
CARLISLE
River Eden
Silloth
Wigton
River Wampool
River Waver
River Caldew
River Petteril
PENRITH
River Eamont
Ullswater
Haweswater Reservoir
Brothers Water
Appleby
Brough
Kirkby Stephen
N
0
5
10km

Two fixed instruments (salmon traps) are licensed on the River Eden near Corby and are operated on a commercial basis. These traps have been in existence for many hundreds of years and were issued with a 'certificate of privilege' by Salmon Commissioners during the nineteenth century.

Several natural barriers exist on the Eden system and as such, prevent access to certain parts of the catchment by migratory fish. Almost the entire Border Esk catchment is accessible to migratory fish.

Three fish passes constructed on the River Caldew at Holmehead, Cummersdale and Buckabank in 1987 reopened the river to migratory fish. The greater part of the river was inaccessible owing to a number of weirs that were constructed for water abstraction purposes. Fish movement into the Caldew has been monitored using a trap at Holmehead. The results are very encouraging, with over 1,500 salmon and sea trout entering the river during 1994. See figure 1 below.

FIGURE 1



The NRA run a hatchery near Carlisle. This is primarily used for producing salmon and sea trout for mitigation and fishery restoration work in the catchment. It is also used for rearing dace and chub and salmon parr as part of the NRA's ongoing fish tagging programme.

The Rivers Waver and Wampool are not significant fisheries, although coarse fish and trout are present in good numbers in certain stretches and both rivers have a small run of sea trout.

The NRA undertakes extensive monitoring work such as electric-fishing surveys. Map 11 indicates juvenile total salmonid densities obtained from electric-fishing surveys in 1992 -1994 and major spawning and nursery areas on each river.

3.3.3 Fisheries Objectives

To maintain, improve and develop fisheries consistent with Regional and National polices.

Water Quality

Water quality should not be allowed to deteriorate below the mandatory limits for pollutants as stated in the EC Freshwater Fisheries Directive for designated salmonid waters. Ideally water quality should meet the guildeline limits for pollutants as stated in the same Directive.

Water Quantity

The NRA will seek to protect the range of flow which reflect as natural a regime as possible. Where low flows are found to be affecting the fishery the NRA will investigate possible remedies

Physical Features

To maintain and improve fishery habitat where appropriate. To ensure river maintenance work such as gravel removal is carried out in such a way as to minimise impact on the fishery, and where possible pursue improvements.

To ensure abstraction arrangements do not impede fish movement, draw in fish or damage resident fish populations.

The following Issues relating to this "use" of the catchment can be found in Section 4 of the plan

4.2.1 Water Abstraction on the River Lowther and River Gelt
4.2.2 Gravel extraction on the River Eden and Esk Catchments
4.2.4 Rivers Waver and Wampool Management Plan.
4.2.9 Failure to meet EC Freshwater Fisheries Directive Standards in the River Petteril.
4.2.15 Fisheries Management Plan
4.2.16 River Eden Coarse Fish Investigation
4.2.17 Rod and Line Catch Returns
4.2.18 Stocking Activity
4.2.19 Survey Data
4.2.20 Lack of Information in Fish Habitat Quality
4.2.21 Net Limitation order in the Solway
4.2.22. Timing of the Salmon and Sea Trout Fishing Season
4.2.23 Illegal exploitation of Salmonids in Inland and Coastal Waters
4.2.26 Fish Eating Birds

3.4 CATCHMENT DRAINAGE - FLOODING AND FLOOD ALLEVIATION

3.4.1. General

This use relates to the protection of people and property against flooding from rivers and the sea. Normally flooding is a result of extreme weather conditions such as very heavy rainfall or storms combined with high tides. Flood events are described in terms of 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. The effectiveness of flood defences can be measured in terms of the return period up to which they prevent flooding. Different types of land use receive different levels of protection, with urban areas generally receiving the greatest protection. The Ministry of Agriculture, Fisheries and Food (MAFF) suggest levels of protection which range from 1 in 200 years for dense urban development to 1 in 5 years for poor agricultural land when considering tidal flooding. Equivalent figures for non tidal flooding are 1 in 100 years and 1 in 1 year.

The flood plain is an important element of the overall river system to convey flood flows. In a major flood event water is "stored" temporarily in the flood plain thereby attenuating flooding downstream.

Historic development on flood plains has led to the need for construction and maintenance of flood defences. The NRA seek to control any activity on the flood plain likely to worsen flood conditions. This is achieved through liaison with local planning authorities to influence the control of development in the flood plain, and through NRA byelaws.

The provision of new flood defences and the maintenance of existing schemes and channel capacity needs to be undertaken with care to ensure minimum impact on other river uses (notably Fisheries and Conservation). To this end extensive internal and external consultations are carried out with all interested parties.

In the river system, certain channels are designated as statutory "Main River". This designation allows the NRA to take certain regulatory actions and also allows, where economically viable, money to be spent on the maintenance and control of the channel. At the same time various control powers are available on all other rivers and streams.

The responsibility for the maintenance of any watercourse normally rests with the riparian landowner, whose ownership as a general rule extends to the centre line of any such river. However, the NRA does have control of the construction of any structure in or close to the statutory Main River. This and other activities likely to affect the bed or bank of the river requires the formal Consent of the NRA.

The NRA has limited powers in respect of consents for weirs, dams and culverts and similar obstructions on watercourses, which are not designated statutory main river. District and County Councils have powers to carry out schemes on such watercourses, but no legal obligation to do so. They would require the NRA's consent under its requirements for overall supervisory duty of drainage matters.

3.4.2 Sea Defences and Coastal Protection

Sea defence is the protection of any low lying land or assets by inundation from the sea.

Coastal protection is defined as the prevention of erosion by the sea of land. This is administered by local authorities.

Shoreline Management Plans (SMP's) produced by Local Authorities are intended to provide a strategic framework for the management of coastal defences in an area. The NRA will contribute to the Solway to St Bees Head SMP.

3.4.3 Local Perspective (see map 12)

The River Eden is a very large river system and significant flooding only tends to occur when there is heavy and persistent rainfall over a large proportion of the whole catchment.

Localised intense rainfall may cause local problems but the river systems as a whole can usually absorb such events without widespread flooding occurring. Haweswater reservoir can have the effect of attenuating flows in the river Eamont by absorbing the peak flows upstream of the dam.

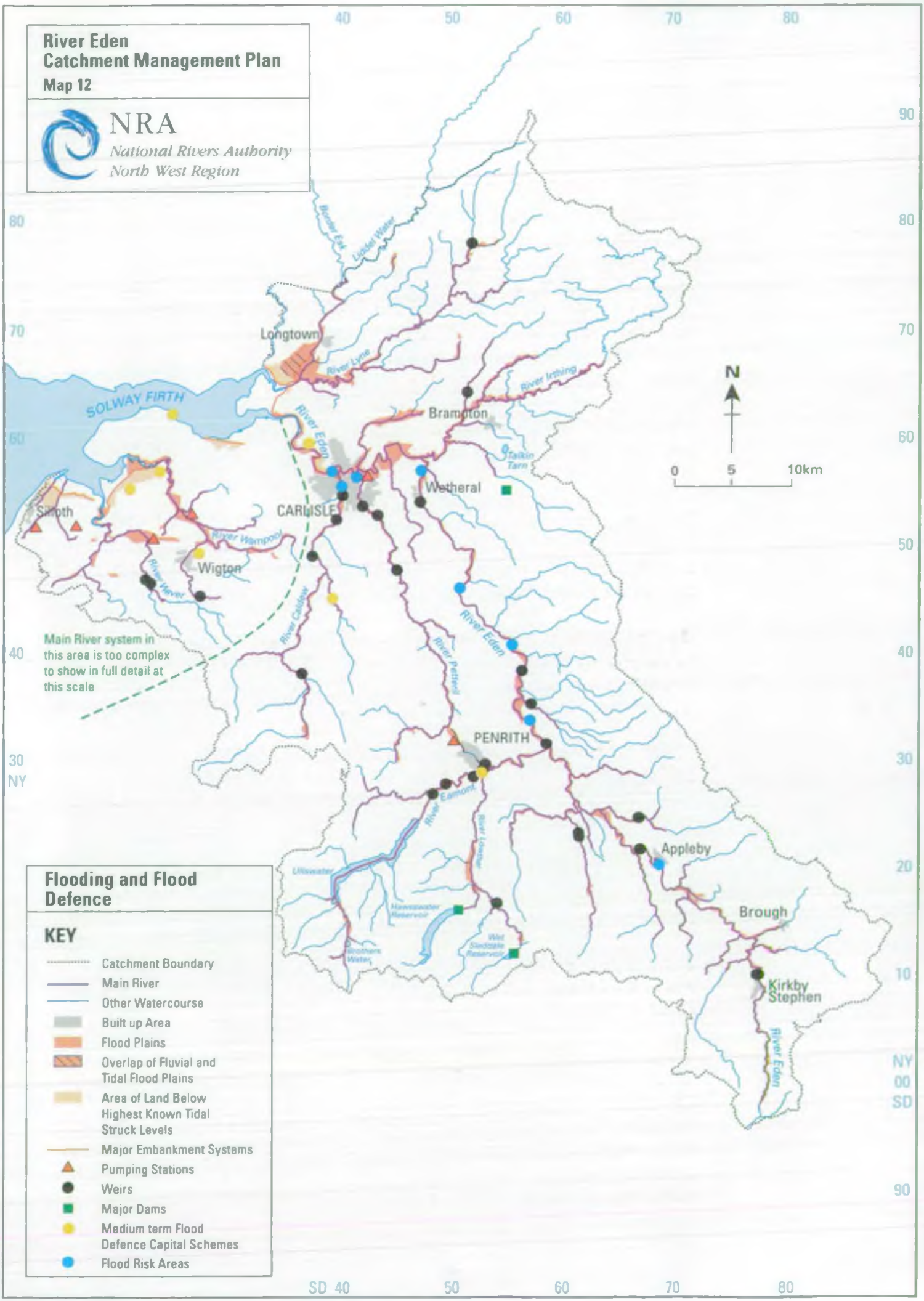
Due to the length of the river system effective flood monitoring can be carried out by the NRA for flood warning purposes. This process involves monitoring flood levels at upstream stations and translating the combined effects of the different tributaries to predict peak flows downstream.

Major floods in the River Eden occurred in March 1968 when the whole system suffered an event of 1 in 70 year return frequency. Appleby, Langwathby, Warwick Bridge and Carlisle suffered extensively. The Carlisle flood bank system was constructed in response to this event.

In January 1995 floods of a return period of 1 in 35 years caused extensive flooding in the Eden Valley. However the Carlisle flood banks prevented significant flooding of properties in the city.

Other large scale flooding occurred in 1982 and 1990 on the River Eden system and in 1984 the Denton Holme area of Carlisle suffered flooding from the River Caldew.

Work has recently started on the construction of new flood defences at Appleby, to bring the level of protection up to 1 in 100 years at a cost of approximately £500,000. This scheme was the subject of extensive consultation with local residents who were concerned to maintain the character of the town. As a result of the consultation process the original proposals were extensively modified and the scheme now only protects Chapel Street and the town centre, but not the Sands area which would have been protected in the original scheme.


River Eden
Catchment Management Plan
Map 12
NRA
National Rivers Authority
North West Region
Longtown
SOLWAY FIRTH
Brampton
Wetheral
CARLISLE
Silloth
Wigton
PENRITH
Appleby
Brough
Kirkby Stephen
River Eden
River Lyne
River Irthing
River Wampool
River Waver
River Caldew
River Petteril
River Eamont
River Lowther
Ullswater
Haweswater Reservoir
Wet Sleddale Reservoir
Talkin Tarn
Main River system in this area is too complex to show in full detail at this scale
N
0 5 10km
Flooding and Flood Defence
KEY
Catchment Boundary
Main River
Other Watercourse
Built up Area
Flood Plains
Overlap of Fluvial and Tidal Flood Plains
Area of Land Below Highest Known Tidal Struck Levels
Major Embankment Systems
Pumping Stations
Weirs
Major Dams
Medium term Flood Defence Capital Schemes
Flood Risk Areas

The NRA is keen to restore river hydrology to a more natural state, and increase water retention within the catchment but does not have powers to achieve this on its own. However, where opportunities arise (e.g. through the planning system) the NRA will pursue this goal.

Giant Hogweed

This alien plant species, which can grow up to 3 metres in height, has been found in increasing density on the catchment. It is an extremely invasive plant, and if left unchecked will grow into dense stands and shade out all other vegetation. When the plant dies back in winter it leaves bare earth which can lead to river bank instability and subsequent erosion.

The sap of the plant causes severe blistering and burns if it comes into contact with human skin. In addition, the shading effect of the plant excludes native plant species thus reducing the nature conservation value of areas it invades.

For these reasons, the NRA is implementing a 10 year campaign of spraying giant hogweed to as far as possible eradicate this species from the catchment.

Flood Warning

The NRA runs the Operation Albion Flood Warning Scheme throughout the region. This involves continuous 24 hour monitoring of weather forecasts, weather radar, actual rainfall, river and tidal levels. If flooding of property is likely to occur the NRA duty officer notifies the Police who then warn Local Authorities, other emergency services and local residents. Operation Neptune is a similar procedure but covers areas vulnerable to tidal flooding. There are flood warning zones in the Eden catchment at Appleby, Eden Valley, Carlisle (Warwick Road and Willowholme area) and Carlisle (River Caldew, Denton Holme area).

Due to the limited resources available to Police forces throughout the country there is a move to consider that the NRA issue warnings direct to the residents and businesses within flood risk zones.

The change in procedure is planned from September, 1996 but it remains with the individual Constabularies to indicate their commitment to the existing system. Cumbria Constabulary have indicated that they do not anticipate any changes, on their part, from September 1996, but acknowledge that later changes may be necessary.

Main River and River Control Structures

There are 692 km of "Main River" in the catchment much of which requires regular maintenance by the NRA to minimise flooding. Maintenance commitment is particularly heavy on the Rivers Waver and Wampool.

Within the catchment there are 35 control structures on the Main River of which 17 are controlled and operated by the NRA. The NRA structures are 7 weirs at flow gauging stations, 7 pumping stations and 3 sluices.

The pumping stations and sluices are operated under certain conditions to minimse the impact of flood events and are mainly situated in and around Carlisle.

The non NRA structures are mainly used for abstraction purposes and are regulated through legislation and the Authority's Land Drainage Byelaws.

Standards of Service For Flood Protection

A system has been developed by the NRA to determine the present standard of service being achieved for flood defence. The system determines whether present levels of maintenance have produced a level of protection to the target standard. The river system is divided into reaches between 4-7 km in length. An assessment is made of the "Land Use" by considering for each reach the agricultural or urban content within the flood plain and for each element (eg road, house, intensive grazing) a score is given. The score is measured by a single unit called a house equivalent and by the score achieved the reach is placed into one of several land use bands. For typical land use relating to each band see appendix 8.

Standards of service maps have not yet been finalised for the catchment, but once completed will form the basis of future maintenance programmes.

Where target standards of protection are not being met, the NRA will consider making capital investment in flood defences. The target standard for urban fluvial flood defences is 1 in 100 years, although a lower standard can be accepted if this is all that can be justified by cost benefit analysis. It must be recognised that it is not feasible to protect all property to the highest possible standard because of cost benefit and environmental constraints.

Development of the Natural Flood Plain

The flood plain of the River Eden through Carlisle is up to 1500 metres wide. This undeveloped land acts as a storage area for floodwaters and it is vital to preserve this flood plain to prevent increasing flood risk to the city. There is continual pressure from developers to allow building within the flood plain, but the NRA will work with Local Planning Authorities in resisting such development unless it can be demonstrated that flood risk is not increased.

3.4.4 Flood Alleviation Objectives

Where justifiable to provide effective flood defence for the protection of people and property to a standard appropriate to land use NRA and MAFF's indicative standards.

To control development and other works in rivers or the flood plain such that risks of flooding are not increased.

To provide adequate arrangements for flood forecasting and warning.

To minimise environmental and ecological damage during flood defence maintenance and improvement works, and take the opportunity to create enhancements wherever possible.

The following Issues relating to this "use" of the catchment can be found in Section 4 of the plan

4.2.2 Gravel extraction on the River Eden and Esk Catchments.
4.2.3 River Eden at Appleby Flood Alleviation Scheme.
4.2.4 Rivers Waver and Wampool Management Plan.
4.2.5 River Caldew/Little Caldew Management Plan.
4.2.6 Flood alleviation issues highlighted by the January 1995 floods.
4.2.7 Thacka Beck culvert in Penrith
4.2.8 "Main River" policy in Urban Areas.

3.5 WATER ABSTRACTION

3.5.1 General

The NRA has a duty to undertake measures to conserve, redistribute or augment water resources and to secure the proper use of water resources.

The NRA has powers to apply to the Department of the Environment to issue Drought Orders to conserve water resources and to designate areas as water protection zones or nitrate sensitive areas.

The NRA controls abstraction and impoundments under a licensing system. Most abstractors are charged for the right to use water in accordance with a tariff based on factors such as licensed quantity, source and season of abstraction and category of use. A number of licences were granted as "licences of right" upon the implementation of the Water Resources Act, 1963. Such licences were based upon evidence of established use and were not necessarily supported by technical appraisal of their impact.

3.5.2 Local Perspective

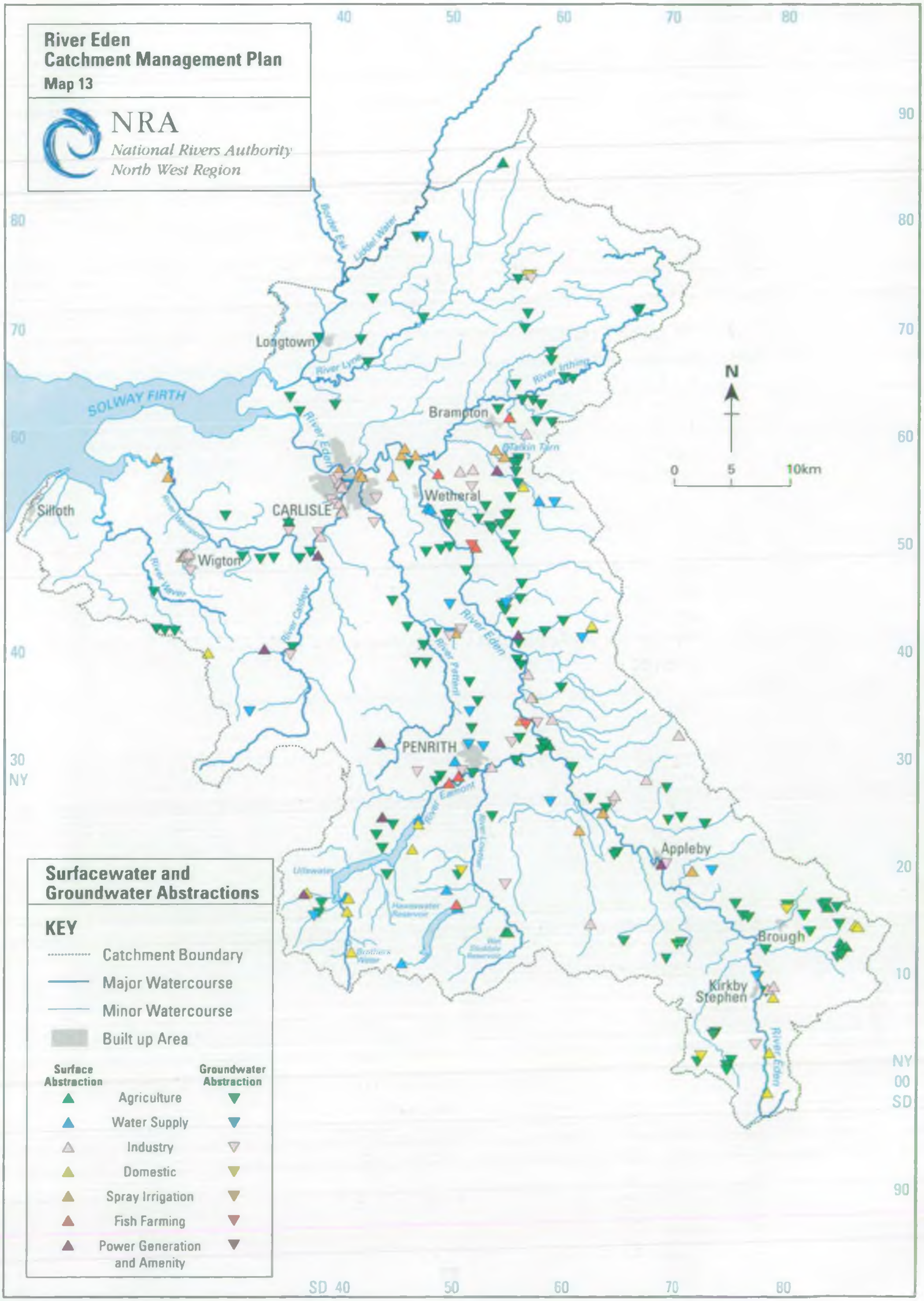
Map 13 shows the distribution of the various licensed surface and groundwater abstractions within the catchment and the purpose of use is indicated by colour coding. In addition to licensed abstractions, the use of surface and groundwater sources for small unlicensed domestic and agricultural supplies is common in rural parts of the catchment.

Surface Abstractions

There are 99 licensed abstractions from surface sources within the catchment. These range from very small abstractions, 272 litres/day for domestic use, to the very large volume abstractions, 991 Megalitres/day, for public water supply purposes. The total volume of water which is licensed to be abstracted annually from all surface sources within the catchment is 374,000 Megalitres/year approximately.

The licences for surface abstractions can be broken down into the following categories with percentage figures of the total daily licensed volume for the catchment.

No. of Licences	Type	Percentage
9	Water Supply	89.98%
8	Fish Farming	4.29%
4	Power Generation	3.0%
22	Industrial	1.5%
6	Amenity	0.8%
17	Spray Irrigation	0.4%
23	Domestic	0.02%
10	Agriculture	0.003%



River Eden
Catchment Management Plan
Map 13
NRA
National Rivers Authority
North West Region
Surfacewater and
Groundwater Abstractions
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area
Surface Abstraction
Groundwater Abstraction
Agriculture
Water Supply
Industry
Domestic
Spray Irrigation
Fish Farming
Power Generation
and Amenity
N
0
5
10km
SOLWAY FIRTH
Border Esk
Liddel Water
Longtown
River Lyne
River Irthing
Brampton
Talkin Tarn
River Eden
CARLISLE
Silloth
Wetheral
Wigton
River Waver
River Caldew
River Petteril
PENRITH
River Eamont
River Lowther
Ullswater
Haweswater Reservoir
Appleby
Brough
Kirkby Stephen
40
50
60
70
80
90
30
NY
20
10
00
SD
SD 40

Groundwater Abstractions

Groundwater may be abstracted from water bearing strata (aquifers) by means of wells or boreholes.

There are 191 licensed abstractions from groundwater sources within the catchment, which range from 272 litres/day for general agricultural purposes to 22.7 Megalitres/day for public water supply. The total licensed volume from groundwater sources within the catchment is 14,000 Megalitres/year approximately.

The licences for groundwater abstractions fall into the following categories, (percentages of the total daily licensed volume).

No of Licences	Type	Percentage
16	Water Supply	73.0%
2	Fish Farming	15.0%
22	Industrial	10.0%
145	Agricultural	2.0%
6	Domestic	0.06%

Surface sources of the catchment, rather than groundwater, have the greatest demands made on them in order to satisfy the needs of licensed abstractors. The sandstone aquifer of the Eden Valley is extensive, and recently there has been increased demand for licensed abstractions from boreholes to satisfy the needs of water supply, industry and particularly agriculture in this part of the catchment.

Discharges from groundwater represent significant contribution to the River Eden baseflow. These have been measured as 340 Ml/d at Warwick Bridge, Wetheral (1976). This compares with a maximum licensed groundwater abstraction from the Permo-Triassic sandstone aquifer of the catchment of 40Ml/d. It is evident that groundwater resources of the catchment are relatively under utilised. However caution is required when considering new abstraction especially in terms of localised impacts on surface water and environmental interests.

Groundwater Protection Policy

There is a need to protect the groundwater resources of the Eden catchment from the potential effects of man's activities. The greatest threat in this catchment is posed by agricultural practice and mineral extraction. Control is exercised across the region in accordance with the Authority's 'Policy and Practice for the Protection of Groundwater'. This considers groundwater protection both in terms of resources in general and sources (abstractions) in particular.

To date source protection zones have been defined for 8 out of North West Water's 9 public supply boreholes within the catchment. Their remaining source and a commercial mineral water supply borehole are programmed for completion by March '97. However, there are numerous private water supplies, used for agricultural, domestic and industrial purposes for which there are no proposals to

define formal protection zones. These need to be considered on a case by case basis.

North West Water Licensed Abstraction for Public Water Supply

North West Water are by far the largest abstractor and are licensed to take a total of approximately 341,422 Ml/year from the catchment.

Groundwater sources are used mainly for local supply. There is a licensed abstraction of approximately 1,032 Ml/d from the Haweswater system and this water is almost totally exported from the catchment, via the Haweswater and Shap aqueducts, to supply the Manchester area.

Water is abstracted from the River Eden to meet Carlisle's supply requirements. In addition, 31 Ml/d can be taken from the River Gelt and springs on Geltsdale, for local supply purposes.

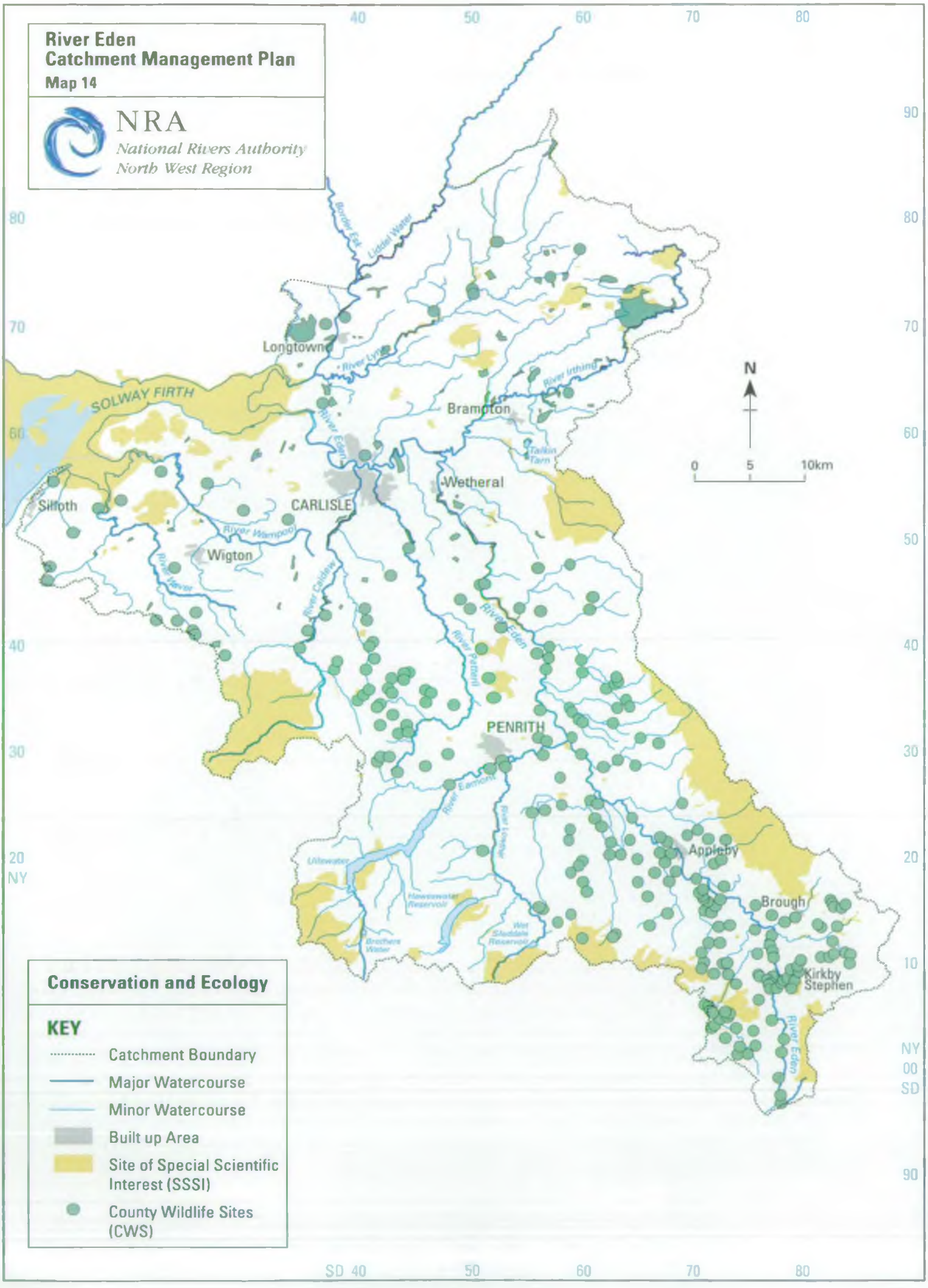
Water Abstraction Objectives

To ensure resources are managed to safeguard the environment protect other ground and surface water uses and existing abstraction licences.

To ensure all surface water sources abstracted for public drinking water supply comply with the EC Directive on the quality of water abstracted for this use.

The following Issues relating to this "use" of the catchment can be found in Section 4 of the plan

4.2.1 Water abstraction on the River Lowther and River Gelt
4.2.5 River Caldew/Little Caldew Management Plan.


River Eden
Catchment Management Plan
Map 14
NRA
National Rivers Authority
North West Region
Longtown
SOLWAY FIRTH
Brampton
Wetheral
CARLISLE
Silloth
Wigton
PENRITH
Appleby
Brough
Kirkby Stephen
River Eden
River Lyne
River Irthing
River Wampool
River Caldew
River Petteril
River Eamont
Ullswater
Haweswater Reservoir
Brothers Water
Talkin Tarn
N
0
5
10km
Conservation and Ecology
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area
Site of Special Scientific Interest (SSSI)
County Wildlife Sites (CWS)

3.6 CONSERVATION - ECOLOGY

3.6.1 General

This section relates to the conservation and enhancement of natural beauty and wildlife, associated with the aquatic environment. This includes formally designated and protected sites and the wider countryside associated with the aquatic environment.

The NRA has a statutory duty to further the conservation and enhancement of natural beauty and protect sites of conservation interest.

3.6.2 Local Perspective

Map 14 shows all the Sites of Special Scientific Interest (SSSI's) within the catchment. In addition County Wildlife Sites (CWS's) identified by Cumbria Wildlife Trust are shown.

A significant proportion of these sites are associated with the water environment and in particular (but not shown) is the River Eden, which is currently being designated a SSSI by English Nature as an example of the best British sandstone and limestone rivers. Shorter lengths of the Rivers Gelt and Lyne are also SSSI for their adjacent woodlands.

There are significant wetlands in the catchment including the series of raised bogs found along the Solway Plain from Solway Moss, through Drumburgh and Glasson Mosses to Wedholme Flow and Bowness Common. These collectively form the largest area of lowland raised bog in Britain.

Water Level Management Plans (WLMPs) are a means by which the water level requirements for a range of activities in a particular area, including agricultural, flood defence and conservation, can be balanced and integrated. The "Conservation Guidelines for Drainage Authorities" (MAFF/DoE 1991) requires the NRA to consult with statutory bodies with a view to drawing up a plan of operational procedures with priority given to SSSI's. The NRA is currently liaising with English Nature to establish which sites are relevant to this process, such that WLMP's will be produced by 1998.

The entire coastal area of this catchment lies within the "Upper Solway Flats and Marshes" SPA, Ramsar, SSSI which is of international importance for its wetlands and bird populations, particularly overwintering wildfowl and waders.

The Eden Valley comprises mostly of pastoral land, much of it for dairy farming. The arable component is relatively limited, whilst there are some commercial forestry plantations and there are important remnants of semi-natural woodland, most notably along the middle reaches where the River Eden has cut a gorge through New Red Sandstone. The most vulnerable habitats have survived on the steeper slopes where farming is more difficult.

The Eden Catchment is considered to be of national importance for otter conservation. Its strongholds are on the Rivers Esk and Lyne with other

population centres found particularly on the River Eden downstream of Kirkby Thore. The headwaters of this catchment are close to those of the Derwent, Kent, Leven and Lune, which is hoped will facilitate the future spread of otters to these rivers and further south where otters are very rare or absent.

The Eden Catchment is also host to the native, Atlantic stream crayfish, a protected species under the Wildlife and Countryside Act. The lime rich headwaters have allowed some localised populations to flourish.

There are 2 major lakes in this catchment Haweswater and Ullswater with several smaller water bodies of which Brotherswater and Blea Water lie entirely within SSSI's.

Associated with these still waters are two rare fish, the Arctic Charr which is found in Haweswater, and the Schelly which is found in Ullswater, Brotherswater, Haweswater and also Red Tarn. The main potential threat to these fish are eutrophication, pollution and the introduction of other fish species.

The most degraded river habitats are on the Rivers Waver and Wampool which rise from the Northern Fells of the Lake District, and flow through low lying improved agricultural land. These have been typically subject to improvement works and regular flood defence maintenance. This has led to limited riverine and corridor interest. Despite this the River Waver provides a home for the northern most population in Britain of the banded demoiselle, a notable local species of damselfly. The NRA is currently pursuing the possibility of a collaborative project to assess the distribution of the species and recommend management practices to secure and protect this isolated population.

Information on the conservation status of the rivers in the Eden Catchment Plan area is far from complete. Only the main Rivers Eden and Eamont have received full river corridor survey. The NRA has only limited knowledge of the remaining majority, where it is associated with Flood Defence maintenance works.

Strategic river corridor survey has proved to be an incomplete method for classifying a rivers conservation value. To remedy this a new methodology called the River Habitat Survey (RHS) is being developed via an NRA National R & D project. Trials were carried out in the region in 1994 with further survey coverage in 1995/1996. It is envisaged that by the end of 1996 it will be possible to compare and contrast the habitat quality of watercourses of the Eden Catchment Plan area in both a regional and national context .

No further strategic river corridor survey is therefore programmed in the Eden Catchment Plan area pending the implementation of the RHS methodology.

Once the RHS methodology is in place and a comprehensive survey is underway the NRA will look carefully at where habitat improvements for wildlife can be made.

Where possible this will be done in conjunction with our conservation partners and with landowners.

3.6.3 Environmental Objectives

The NRA is fully committed to furthering conservation and will adopt the following policies in order to conserve, further and enhance the water environment, within all NRA operations and third party proposals which the NRA licence or are consulted on.

In areas of national conservation importance (e.g. nationally designated site or with an endangered species under Schedule 5 and 8 of the Wildlife and Countryside Act 1981) the NRA will protect those features which make it so.

In areas of local conservation importance (e.g. Country Wildlife Site or with locally rare species) and those which provide a wide variety of habitats and a natural river corridor, the NRA will ensure sensitive river management to maintain those interests and prevent them from being degraded.

In areas with limited conservation interest (e.g. previous unsympathetic river management) but which do contain features of note, the NRA will encourage sensitive river management.

In areas of poor conservation interest, the NRA will endeavour to improve the value of these areas, though this may be in the medium term.

In areas with effectively no conservation interest (e.g. culverts), rehabilitation is a long term objective.

Overall, current policy is to ensure no detriment and to pursue enhancements where possible. The NRA supports the concept of buffer zones of semi natural vegetation along river banks, but as a non land owning, non grant giving organisation is unable to promote this directly.

Where opportunities arise through the NRA flood defence maintenance and capital programmes or through collaborative projects with others then provision of buffer zones will be pursued where appropriate.

The following Issues relating to this "use" of the catchment can be found in Section 4 of the plan

4.2.2 Gravel removal on the Eden and Esk Catchment
4.2.4 Waver, Wampool Management Plan
4.2.24 River Eden SSSI designation
4.2.25 Protection of Native Crayfish
4.2.26 Fish Eating Birds
4.2.27 Status of the otter in the catchment

3.7 *CONSERVATION - LANDSCAPE & HERITAGE*

3.7.1 General

The NRA has a statutory duty to promote the conservation and enhancement of natural beauty for inland and coastal waters and for land associated with such waters.

There is a statutory duty to have regard to the desirability for protecting and conserving buildings, sites and objects of archaeological, architectural or historic interest.

These duties cover nationally designated sites e.g. National Parks, Scheduled Ancient Monuments as well as locally valuable sites.

3.7.2 Local Perspective (see map 15)

Over half the catchment is designated for landscape value, characterised by generally unspoilt river valleys, with gentle wooded slopes and improved valleys for dairy farming. The landscape is dominated by agriculture, semi-natural habitat and forestry plantations. The farm landscape is characterised by hedgerow trees, with stone walls replacing these over an altitude of 200-250m.

The character of the rural landscape has been identified by Cumbria County as being under pressure for change and policies are in place to protect rural features such as barns and walls. The Eden Valley, which provides a route between the Cumbrian and Pennine Hills is a natural corridor for pipelines, roads and powerlines which impact on the landscape quality of the valley.

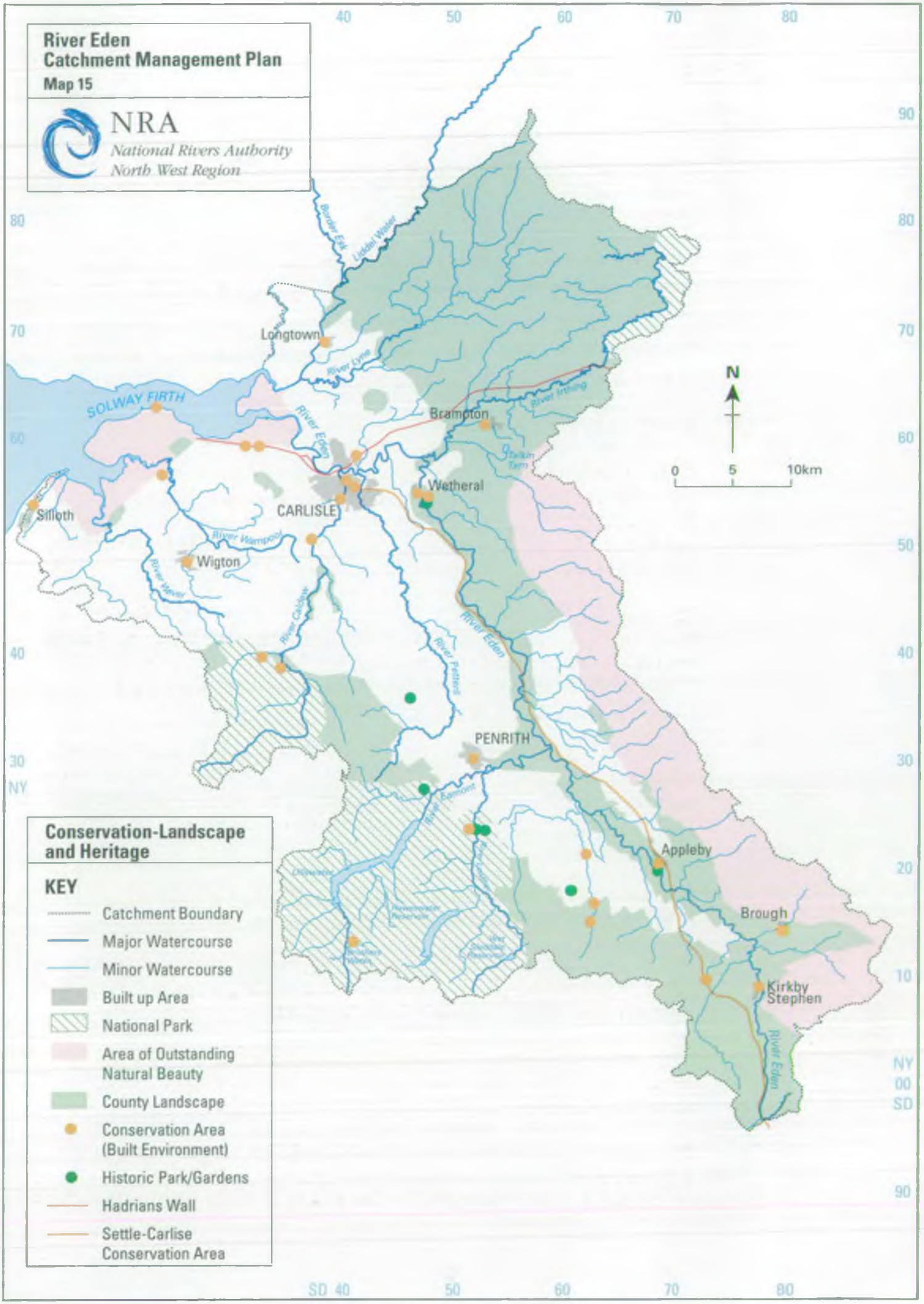
The Waver and Wampool catchments of the Solway Basin, consist of a network of drains enabling mainly arable farming to occur. This is a highly managed open landscape, with straightened steep-sided channels, tree-less river corridors and farm fencing to the bank top. Only small remnants of semi-natural banks and woodland remain.

Flood banks occur on the lower sections of the Eden and Esk but are generally set-back to retain a natural river corridor.

Within Carlisle City, the Eden, Petteril and Caldew corridors are designated Areas of Local Landscape Significance, illustrating the relatively unspoilt quality of these river valley landscapes even within an urban setting.

Many areas have their own distinctive style of building ranging from fine red sandstone farmhouses to mud-walled and cruck-framed barns, this local style of architecture is an important feature of the Cumbrian landscape.

Recent archaeological surveys within the National Park have shown that many features have still to be recorded, with features ranging from national to local importance, including evidence of the former use of water power on several rivers.


River Eden
Catchment Management Plan
Map 15
NRA
National Rivers Authority
North West Region
Conservation-Landscape and Heritage
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area
National Park
Area of Outstanding Natural Beauty
County Landscape
Conservation Area (Built Environment)
Historic Park/Gardens
Hadrians Wall
Settle-Carlise Conservation Area
N
0 5 10km
SOLWAY FIRTH
Longtown
Brampton
Wetheral
CARLISLE
Silloth
Wigton
PENRITH
Appleby
Brough
Kirkby Stephen
River Eden
River Lyne
River Irthing
River Wampool
River Waver
River Caldew
River Petteril
Talkin Tarn
Border Esk
Liddel Water
NY
SD

Designations at National Level

The National Parks and Areas of Outstanding National Beauty (AONB's) cover about 30% of the catchment, including the majority of headwaters. The Solway AONB includes lower sections of the Eden, Waver and Wampool an open landscape characterised by saltmarsh. A management plan for the AONB is currently being produced with the assistance of a small "steering group". The NRA is represented on this group and welcomes the production of this plan.

The Lake District Environmentally Sensitive Area (ESA) designated by the Ministry of Agriculture, Fisheries and Food (MAFF) covers 90% of the National Park area. The upper section of the Eden falls within the Pennine Dales ESA. These areas are managed to safeguard or improve their landscape, wildlife and historical value.

The catchment also includes a number of Scheduled Ancient Monument and 7 sites on the English Heritage Register of Parks and Gardens. Hadrians Wall running along the Irthing Valley is a World Heritage Site.

Designations at County Level

County Landscapes cover approximately 30% of the catchment, these are important for their topographical, visual, cultural or historical character. This includes the majority of the Esk, Lyne, Irthing and Eden River Valleys.

Twenty eight of the catchments towns and village centres are designated Conservation Areas for the special historic, archaeological or architectural interest, including the Settle-Carlisle rail line.

Summary

In summary the catchment contains a significant area of high quality river valley landscapes and buildings which need to be conserved, but also the highly managed catchments of the Waver and Wampool which provides scope for river enhancement.

3.7.3 Objectives

To ensure NRA activities conserve and where possible enhance the landscape and heritage associated with the aquatic environment.

The following Issues relating to this "use" of the catchment can be found in Section 4 of the plan

4.2.4 Rivers Waver and Wampool Management Plan.

3.8 *WATER BASED RECREATION AND AMENITY*

3.8.1 *General*

The water environment is a particularly important area of leisure pursuits. Many studies have revealed that the presence of water at any site is an important factor in drawing people to that location for a whole range of recreational activities. Many activities use the water itself e.g. angling, windsurfing and boating. Other forms of recreation have a link with the water but do not actively use it e.g. a picnic by the lake or a walk by the river.

The NRA will take recreation into account when it undertakes its core function activity and promote the use of inland and coastal waters and associated land for recreation.

The NRA is one of many parties with an involvement in recreational issues on the countryside. Determining the role of the different parties is generally a matter of judgement and is influenced by the policy of the various bodies and the resources available.

Consideration needs to be given to whether the role of the NRA is to provide facilities for specific sports, for more general informal recreation of for a combination of these options.

Increased use of flood defence assets and incorporating recreational facilities into NRA Flood Defence Capital Schemes may be one way forward.

With the exception of the public right of way network access to the banks of rivers and stillwaters is controlled by the owners of the surrounding land. In tidal waters there is a public right of navigation and in some non-tidal waters public rights of navigation have become established. These sites however represent the exception rather than the rule.

The use of the water surface itself in the majority of non-tidal waters is controlled by the riparian owners. Generally the owner of one bank controls up to the mid line of the watercourse. The consequences of this situation is that most recreational activity related to water is controlled through formal or informal agreements with landowners.

Angling is numerically the single most important active recreation which takes place in the waters in the plan and is dealt with in Section 3.3 Fisheries.

3.8.2 *Local Perspective*

Current Situation

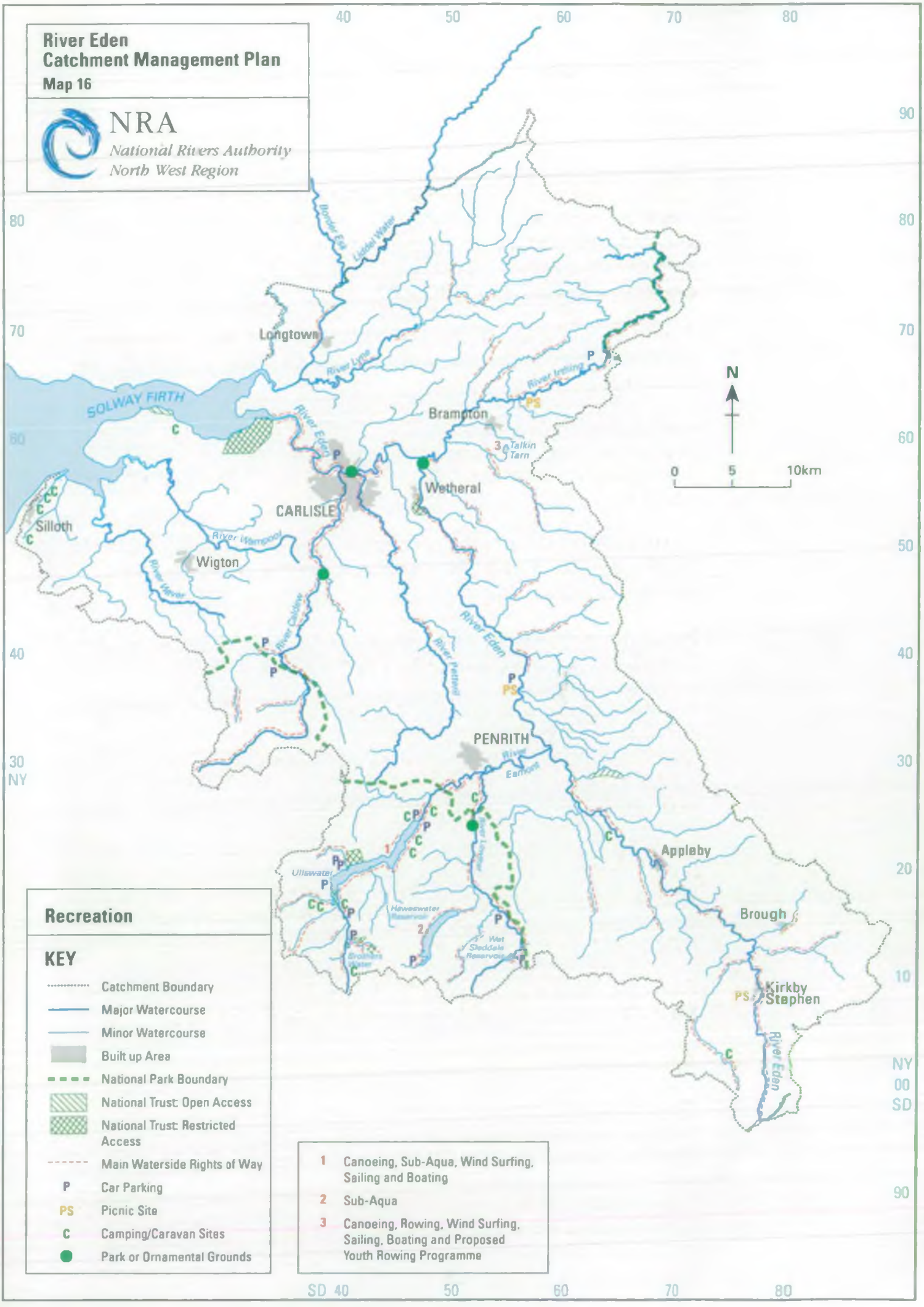
The NRA does not own any recreation assets within the plan area.

The area caters for the recreational demands of residents but also for day visitors and during the summer months a very sizeable influx of holidaymakers. This can lead to conflicting pressures for water bodies in the area. Recreation and

River Eden Catchment Management Plan

Map 16

NRA
National Rivers Authority
North West Region



Recreation

KEY

- Catchment Boundary
- Major Watercourse
- Minor Watercourse
- Built up Area
- National Park Boundary
- National Trust: Open Access
- National Trust: Restricted Access
- Main Waterside Rights of Way
- P — Car Parking
- PS — Picnic Site
- C — Camping/Caravan Sites
- Park or Ornamental Grounds

1. Canoeing, Sub-Aqua, Wind Surfing, Sailing and Boating
2. Sub-Aqua
3. Canoeing, Rowing, Wind Surfing, Sailing, Boating and Proposed Youth Rowing Programme

enjoyment of the countryside is therefore of considerable economic importance to many of the communities in the area.

Only 1 of the Lake Districts major lakes lie within its boundaries namely Ullswater. In addition the catchment contains one of the regions major and scenically important reservoirs, Haweswater.

The locations of the main still and running waters are given on map 16 together with the major locations for sporting activities.

The NRA's recreation specific responsibilities extend only to England and Wales. The only function which extends to the parts of the Border Esk in Scotland is Fisheries. This does of course include the regulation of the angling which takes place in the Esk and its associated watercourses in Scotland, but does not extend to any other forms of recreation.

Canoeing

The rivers in the area are generally relatively shallow at least through much of their length. The consequence of this is that in addition to angling canoeing is often the only watersport which is feasible. Canoeing also occurs to varying degrees on most of the stillwaters in the area.

Most of the still waters and all of the non-tidal rivers in the area have no public rights of navigation. Consequently anyone wishing to "navigate" these waters can only do so with the permission of the owners. Navigation rights are believed to exist on Ullswater. The NRA is not responsible for navigation in this or any other water in the catchment.

Perhaps the greatest conflict between recreational pursuits which exist in the area is between anglers and canoeists. This is not a new phenomenon and work aimed at resolving the conflict presents major challenges.

Access agreements are recognised to be the most effective way in which owners allow canoeists access to their waters whilst establishing a framework of rules. Access agreements are likely to contain sections dealing with the following subjects:-

Times of the year when canoeing is allowed.
River flow levels which may have to be achieved before canoeing can take place.
Areas of the river where special care is required e.g. holding pools and spawning area. Nature of the consideration to be given to other river users.
Landing and launching points.

Most access agreements contain provisions which separate the users in either time or space. Most commonly canoeing is excluded from important fishing areas when fishing is most worthwhile. Limited canoe access agreements exist on some stretches of river and these arrangements have generally been brought into being by agreement between the British Canoe Union and the landowners in question.

The NRA recognises that its main role in this area is likely to be the bringing together of landowning, canoeing and fishing interests who are keen to further the multiple use of waters whilst serving to minimise conflict. The NRA's knowledge of the range of issues involved is likely to place the Authority in a unique position to assist this process.

Other Active Water Based Recreation

Bathing, sailing, wind-surfing (board sailing) and sub-aqua are the main additional activities which occur on the areas waters.

The sailing sports are catered for mainly on Ullswater and private owners, activity centres and commercial operators all play a part in the "operation".

Water Related Recreation and Amenity

The network of rights of way near or alongside water together with the opportunities that exist for vehicle parking are key features in allowing people the opportunity to maximise the "waterside experience".

Map 16 gives the location of the main waterside rights of way and associated car parks in the area. Although the main network of public rights of way in the area caters for a considerable demand all year it is put under particular stress during peak Summer months.

The Cumberland Way which is a long distance regional footpath runs East to West through the area, frequently running alongside or passing near water. The route ends in Appleby as do a number of other significant regional paths including the Westmorland Way.

Future Situation

The NRA has recently produced a Regional Recreation Strategy to cover its activity on this function. It must be recognised that the NRA is only one of many bodies involved in the field of recreation and in furthering recreation it will try to use opportunities for collaborative activity whenever possible.

In particular the NRA recognises that the main opportunity to provide features of material benefit for recreation will arise through the Flood Defence Capital and Maintenance programmes. In addition it seems likely that more can be achieved for those interested in facilities for informal countryside recreation associated with water than for those with a specific watersport in mind.

3.8.3 Objectives

To maintain, improve and create facilities for recreation at locations where NRA works (capital and revenue) are being undertaken.

To maintain waters of sufficient quantity and quality to allow a high standard of recreational experience.

Where appropriate to take opportunities to promote water related recreation through e.g. collaborative activity.

The NRA will ensure its recreational work is sensitive to other uses of the water environment and does not damage the environment of the area especially at sites designated of local or national significance.

Recreation Resource Limitations

The NRA's staff and financial resources allocated to the Recreation function are small.

Mechanisms such as this catchment plan and the Regional Recreation Policy will enable the resources to be targeted to the best effect.

The following Issues relating to this "use" of the catchment can be found in Section 4 of the plan

4.2.28 Promotion of Access to Water for Recreation.

3.9 *DEVELOPMENT*

3.9.1 General

The NRA is taking a more pro-active role in the land-use planning system. This is in terms of advising planners on matters concerning the water environment to ensure future development is sustainable and land-use patterns are guided through consultation and influence of NRA documents such as this CMP.

Developments must be considered when assessing the use of a river catchment. This relates to existing and predicted future residential, commercial and industrial development which is identified in adopted and draft County Structure and District Local Plans. These plans identify policies against which the Local Planning Authorities (LPA's) consider development proposals.

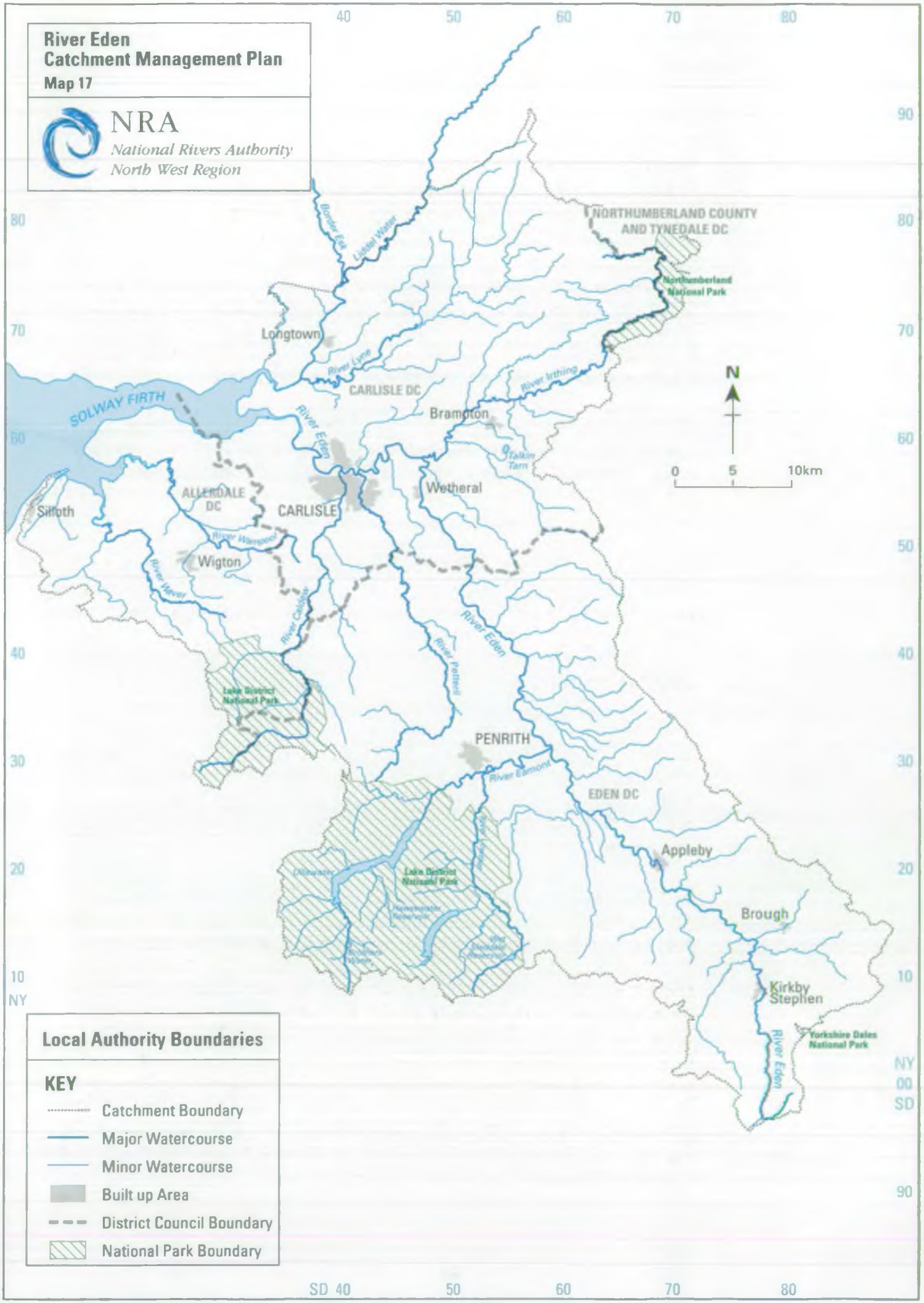
The NRA seeks to pursue its aims and policy objectives in relation to new development through the planning consultation process. The final determination of decisions on planning matters rests with the LPA's, however, government guidelines advise on the need to consider the NRA's concern when formulating a decision.

The NRA is a statutory consultee under certain planning legislation and our advisory role provides LPA's with guidance on development proposals which may have an impact on the water environment as well as highlighting proposals which may require NRA consents or licences.

3.9.2 Local Perspective

The majority of the catchment is within the Cumbrian Districts of Eden and Carlisle, with significant sections of Allerdale and the Lake District National Park. There is a small section of the Northumbrian District of Tynedale in the North Eastern section of the catchment and a very small part of the Northumbria National Park and Yorkshire Dales National Park in the southern part of the catchment. (See Local Authority Map).

The LPA's produce land-use development plans. These plans have to take account of national planning guidance and Regional Planning Guidance in their preparation. Department of the Environment guidance provides a means of establishing possible future land use trends and land-use allocations which may affect the water environment. The catchment contains many areas of good and in some parts, exceptional environmental quality, especially in the South West around Ullswater and Haweswater, the North West around the upper Solway flats and marshes and the North Eastern Pennines areas. The catchment is part of an area of great importance for nature conservation, landscape quality and cultural heritage. As the catchment is predominantly rural in character with only a few main settlements, such as Carlisle, Penrith and Appleby, planning policies so far formulated reflect the commitment to managing this rural environment as well as maintaining the existing rural communities.


River Eden
Catchment Management Plan
Map 17
NRA
National Rivers Authority
North West Region
NORTHUMBERLAND COUNTY AND TYNEDALE DC
Northumberland National Park
Border Esk
Liddel Water
Longtown
River Lyne
CARLISLE DC
River Irthing
SOLWAY FIRTH
River Eden
Brampton
Talkin Tarn
Wetheral
ALLERDALE DC
CARLISLE
Silloth
River Wampool
Wigton
River Waver
River Caldew
River Petteril
River Eden
Lake District National Park
PENRITH
River Eamont
EDEN DC
Appleby
Brough
Kirkby Stephen
Yorkshire Dales National Park
River Eden
N
0
5
10km
Local Authority Boundaries
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area
District Council Boundary
National Park Boundary
40
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60
70
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90
10
20
30
NY
SD

Development plans contain policies which provide the broad strategic planning framework, in the case of the structure plans, and more detailed and site specific proposals to guide development in the Districts and National Parks in the Local Plans.

To minimise the potential for development to increase flood risk, the NRA has agreed to carry out surveys of floodplain, washlands and other land liable to flood, and to establish the effects of increased run off on existing development. Once completed these surveys will be passed to local Planning Authorities to assist them in the development of their Local Plans and help ensure planning decisions take account of flooding issues.

To ensure development plans have adequate regard to the protection and conservation of the water environment, the NRA has produced Guidance Notes for Local Planning Authorities on the methods of protecting the water environment through Development plans.

The NRA has promoted the incorporation of the sentiments of these statements into development plan policies and the table at page 43 indicates the current position of plan preparation together with LPA policy references, where the intentions of the guidance statements has been included.

The table indicates policy guidance uptake and highlights the omissions. The NRA will use this information to improve the uptake of guidance statements for water issues in development plans, as opportunities arise. As only a small part of the catchment is within the County of Northumbria and our Yorkshire and Northumbria Region plays the lead role in planning matters in these LPA's, no assessment has been made of their development plan policies.

It is hoped that the LPA's will work with the NRA so that the information and actions arising in this CMP will be integrated into their respective development plans. The closer integration of water and land use planning and management is an essential element of Agenda 21, the blueprint for sustainable development that was launched at the world summit held in Rio de Janeiro in June 1992. Many LPA's are now preparing Local Agenda 21 documents and Environmental Audits and the NRA will assist where appropriate to try and ensure decisions in the planning field will not deny future generations of the best of today's environment.

For the above reasons the NRA will seek to ensure the following policy objectives will be translated into land-use planning policy and be considered when planning applications are being assessed.

3.9.3 Development Policy Directions

Flood Defence

To discourage new buildings and land raising in areas at risk from flooding.

- by ensuring new development is not at risk from flooding and does not put other areas at risk where it could endanger life or damage property.

- by ensuring work which is needed to reduce the risk of flooding created by a new development is paid for by the developer and not the public.

- by encouraging continuous unobstructed areas adjacent to watercourses to ensure essential maintenance access or flood flows.

Water Quality

To protect and improve the quality of the Catchments, surface waters and groundwaters

- by ensuring new development complies with the NRA's Policy and Practise for the Protection of Groundwater document.

- by ensuring new development is served by satisfactory arrangements for the disposal of foul sewage, trade effluent and surface water

- by encouraging, where there are sewage treatment capacity problems, new development to be phased to coincide with improved infrastructure

- by ensuring appropriate development complies with the Control of Pollution (Silage, Slurry, Agricultural Fuel Oil) Regulations 1991

- by ensuring leachate and drainage is monitored from contaminated land sites

Water Resources

To protect surface waters and groundwaters from derogation arising from development including the redevelopment of derelict and contaminated land.

Conservation and Enhancement of the Water Environment

To protect from development areas of aquatic value and important elements of the water environment

- by highlighting the areas of the water environment which are or have the potential to be of value

- by discouraging forms of development which would have an adverse impact in nature conservation, wildlife, landscape and heritage or fisheries, recreation and amenity.

The following Issues relating to this "use" of the catchment can be found in Section 4 of the plan

4.2.11 Impact of Discharges from Combined Sewerage systems.
4.2.13 Lack of rural sewerage leading to localised pollution.

NRA GUIDANCE STATEMENTS AND LPA DEVELOPMENT PLAN POLICIES

	LPA Plan policies which protect the water environment (their plan policy reference shown)			
Development Plan	**Water Quality and Water Resources**	**Flood Defence**	**Fisheries, Recreation and Conservation**	**Minerals and Waste Disposal**
Cumbria County Council and Lake District Joint Structure Plan 1991 - 2006. Adopted July 1995.	22,23	24	17	58, 61
Cumbria Minerals and Waste Local Plan Draft Consultation ended September 1995				5,6
Lake District Local Plan including Minerals and Waste Public Inquiry ends December 1995	UT1, NE9	UT 3-5	NEW POLICY	M1, M2 and W5
Eden Local Plan Public Enquiry commences November 1995	SE1	SE9		
Carlisle Local Plan Public Enquiry expected February 1996.	E19 E21	E17	E18	
Yorkshire Dales Local Plan Adoption expected early 1996.	WE1, WE2, WE3	WE4	WE4	

Table produced September, 1995

NB - Boroughwide Allerdale Local Plan is not expected for public consultation until early 1996.

3.10 WASTE DISPOSAL

3.10.1 General

The use of landfill sites remains the most important means for the disposal of waste in the UK and is likely to remain so for the foreseeable future.

Waste Regulation Authorities process and issue Waste Management licences, which are required for all operations involving handling, storage, treatment and disposal of controlled wastes. The NRA is a statutory consultee on applications for waste management licences and will seek to ensure waste disposal development pose no unacceptable risk of pollution to controlled waters.

All sites receiving non inert and putrescible wastes produce leachate which is a polluting liquid effluent formed during biological and chemical degradation of the waste. The NRA insists on engineered containment to minimise the risk of leachate escape and thus prevent pollution of ground and surface waters and comply with regulatory requirements imposed by European Directives and U.K. legislation and policy. Historically landfill sites were not engineered as containment sites and relied primarily on the factors of attenuation and dilution. Some of those sites have been known to cause pollution problems.

There is some indication from Waste Regulation Authorities that as the cost and regulation of land filling continues to increase land spreading of wastes to benefit agriculture may escalate.

Contaminated land arises largely as the result of past industrial activities which have left behind a legacy of substances in or on the ground. The NRA has a specific interest in contaminated land because it may represent a source of water pollution.

3.10.2 Local Perspective

A total of 124 waste facilities have been licensed within the catchment since 1976, as follows:-

Carlisle District	77 sites	
Allerdale Borough	6 sites	Of this number 40 are currently
Eden District	41 sites	licensed. (See Map 18)

In addition there is approximately 30 scrap yards/metal reclamation facilities which will require licensing or registering for exemption status.

Closed landfills are the major concern that pose a potential threat due to their lack of engineered containment and leachate management. This has led to minor deterioration of surface water quality at some sites.

The Environmental Protection Act, 1990, now requires a certificate of completion for all licensed facilities. A Certificate will not be issued by the Waste Regulation Authority until the operator proves to the satisfaction of NRA that the site poses no unacceptable risk of pollution to Controlled Waters.

Contaminated land may represent a source or potential source of water pollution. Contaminated land is not solely confined to derelict land. Many existing and active industrial sites are contaminated from spillage and malpractice. The task of assessing the impact of contaminated land on groundwater and indirectly on surface water (in the form of springs or diffuse discharge) is difficult and often hindered by the complex hydrogeology of the area. Groundwater provides the baseflow of many surface water systems.

The NRA is not a statutory consultee to the Planning Authority with regard to development potential of contaminated land. The register of contaminated land under Section 143 of the Environmental Protection Act (EPA) was withdrawn and therefore a specific list of contaminated land was not produced by Carlisle and Eden District Council.

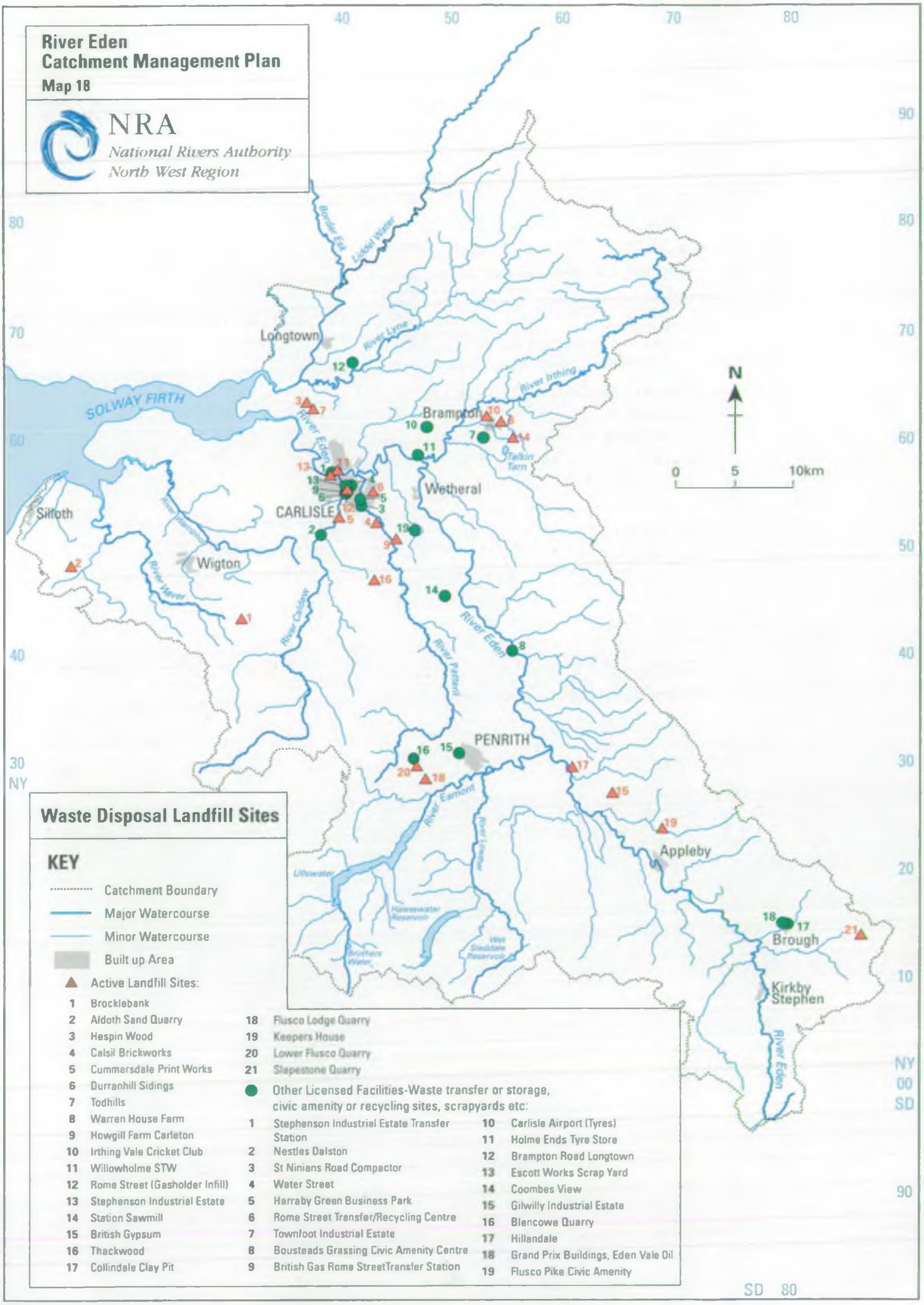
Planning applications are assessed on a site specific basis to ensure the development proposal does not cause or exacerbate pollution problems. Remediation following site investigations may be required where necessary.

3.10.3 Objectives

To prevent the pollution of groundwater and surface water or damage to wetlands resulting from the disposal of waste to land.

The following Issues relating to this "use" of the catchment can be found in Section 4 of the plan

4.2.3 Appleby Flood Alleviation Scheme and contaminated land.
4.2.9 Failure to meet EC Freshwater Fisheries Directive Standards in the River Petterill.


River Eden
Catchment Management Plan
Map 18
NRA
National Rivers Authority
North West Region
Waste Disposal Landfill Sites
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area
Active Landfill Sites:
1 Brocklebank
2 Aldoth Sand Quarry
3 Hespin Wood
4 Calsil Brickworks
5 Cummersdale Print Works
6 Durranhill Sidings
7 Todhills
8 Warren House Farm
9 Howgill Farm Carleton
10 Irthing Vale Cricket Club
11 Willowholme STW
12 Rome Street (Gasholder Infill)
13 Stephenson Industrial Estate
14 Station Sawmill
15 British Gypsum
16 Thackwood
17 Collindale Clay Pit
18 Flusco Lodge Quarry
19 Keepers House
20 Lower Flusco Quarry
21 Slapestone Quarry
Other Licensed Facilities-Waste transfer or storage, civic amenity or recycling sites, scrapyards etc:
1 Stephenson Industrial Estate Transfer Station
2 Nestles Dalston
3 St Ninians Road Compactor
4 Water Street
5 Harraby Green Business Park
6 Rome Street Transfer/Recycling Centre
7 Townfoot Industrial Estate
8 Bousteads Grassing Civic Amenity Centre
9 British Gas Rome StreetTransfer Station
10 Carlisle Airport (Tyres)
11 Holme Ends Tyre Store
12 Brampton Road Longtown
13 Escott Works Scrap Yard
14 Coombes View
15 Gilwilly Industrial Estate
16 Blencowe Quarry
17 Hillendale
18 Grand Prix Buildings, Eden Vale Oil
19 Flusco Pike Civic Amenity
N
0 5 10km
SOLWAY FIRTH
Longtown
Brampton
Wetheral
CARLISLE
Silloth
Wigton
PENRITH
Appleby
Brough
Kirkby Stephen
River Eden
River Lyne
River Irthing
Liddel Water
Border Esk
River Caldew
River Petteril
River Eamont
River Lowther
River Wampool
River Waver
Ullswater
Haweswater Reservoir
Talkin Tarn
NY
SD

3.11 AGRICULTURE

3.11.1 General

Agriculture activity has the potential to have significant impact on the water environment. In the main, problems arise from :-

- Pollution of ground and surface water from inadequate storage and handling of animal waste, silage, fertilisers and agro chemicals such as sheep dip.

- Ecological damage caused by intensive practices, infilling of ponds, land drainage and loss of riparian habitat.

However as the emphasis on agricultural production has diminished opportunities to reverse the trend of environmental damage have arisen.

These include:-

- Introduction of the Control of Pollution (Silage, Slurry and Agricultural Fuel Oils) Regulations 1991 which set legally enforceable minimum standards for storage facilities.

- Introduction by MAFF of the Code of Good Agricultural Practice for the Protection of Water.

- Promotion of less intensive and more environmentally friendly farming through schemes such as the MAFF habitat creation scheme and Environmentally Sensitive Area (ESA) Scheme. The Countryside Commission, Lake District National Park, English Nature and other bodies also provide grants for specific projects in certain circumstances.

3.11.2 Local Perspective

Agriculture is an extremely important industry on this predominantly rural catchment and remains one of the most significant threats to water quality.

The upland areas of the Lakeland Fells and Pennines support sheep farming with some beef cattle. Dairy farming becomes increasingly important lower down the valleys and is very intensive in the lowland areas of the Eden Valley, Petteril, Caldew and Solway Plain.

Considerable effort has been put in on the catchment by the NRA the Agricultural Development Advisory Service (ADAS) the farming community and other groups towards reducing pollution from farm premises.

Current pro-active project include:-

- Running farm waste management plan courses with agricultural students at Newton Rigg College.

- Prioritising risks associated with livestock waste systems in conjunction with ADAS.

- Campaigns on areas of the catchment with a particularly bad record of farm pollution incidents or problems with water quality.

3.11.3 Objectives

To minimise the impact of agricultural activity on the water environment and promote enhancement of the environment where possible by:-

- Enforcing the Control of Pollution (Silage, Slurry and Agricultural Fuel Oils) Regulations 1991 and encouraging compliance with the Code of Good Agricultural Practice for the Protection of Water.

- Encouraging maintenance and enhancement of important aquatic conservation features such as riparian habitat/woodland, wetland and woodland areas and farm ponds.

The following Issues relating to this "use" of the catchment can be found on Section 4 of the plan

4.2.12 Pollution from farm effluent.

3.12 FORESTRY

3.12.1 General

Historically, extensive coniferous forestry has had a number of impacts on the water environment, including:-

- Increased sediment load particularly during planting, maintenance and felling operations.
- Increased run off rate while the trees are establishing.
- Reduced river base flows due to increased evapotranspiration interception of precipitation and water storage as the trees mature.
- Concentration of acid deposition.

The NRA has worked closely with the Forestry Authority in production of "The Forest and Water Guidelines".

These guidelines are comprehensive and the NRA is confident that future forestry activity undertaken according to this guidance will not cause the problems outlined above. The NRA will support woodland planting along river corridors and in flood plains where this can be shown to provide environmental benefits.

3.12.2 Local Perspective

The most significant tract of forest in the catchment is Spadeadam Forest in the upper reaches of the River Irthing. Elsewhere there are isolated conifer plantations. Locally there is good contact established with the Forestry Authority and Forest Enterprise (the commercial arm) and joint training sessions have been carried out with a view to ensuring The Forest and Water Guidelines are implemented and good pollution prevention practices are carried out.

The Coalburn Experiment

This is a research and development project to monitor the long term effects on the water environment of conifer afforestation and cropping in upland areas. It is an intensive hydrological study of the catchment of a small tributary and the River Irthing called Coal Burn. The main work has been done by NRA, NWW the Forestry Commission and The Institute of Hydrology.

It is a unique study looking at a catchment changing from an open moorland through to mature closed forest and beyond to the post cropping stage. So far the study has run 25 years covering the change from open moorland to forest establishment and the approach to maturity.

It is a very complex piece of research which cannot be adequately covered here. However it has so far revealed a number of important and in some cases unexpected results; for example it has demonstrated:

- The unexpectedly long lasting effects of the initial ploughing which is still important after 20 years.

- Ground preparation increased total flows (especially by augmenting low flows) and enhanced peak flows.

- The growth of the trees has reduced water yields and peak flows together with a weak trend of declining low flows.

- Coal Burn appears to be in a transitional state with flows reducing as tree growth reaches canopy closure, but is still higher than the pre-drainage pattern.

- Overall the results provide support for having a mixed aged forest structure to minimise environmental impact.

3.12.3 Objectives

To protect the water environment from the potential adverse effects of intensive forestry by adoption of the Forest and Water guidelines.

To support woodland management and tree planting where this can be shown to provide benefits to the water environment.

3.13 HYDROPOWER

3.13.1 General

Hydropower is a renewable source of energy which should reduce emissions to the environment. The NRA supports the Government's policy to develop renewable energy sources wherever they have prospects of being economically attractive and environmentally acceptable. It has published guidelines to developers in a leaflet "Hydropower Developments and the National Rivers Authority".

There may be positive and negative effects on the water environment. If an abstraction licence is issued, subject to the rights of existing users there may be limitations incurred on all future applications upstream because all the resource is committed to the hydropower user. There may be benefits for water quality in that some types of turbines increase oxygenation. However, if an impounding licence is required and significant amounts of water stored, the residence time of water is increased causing algal growth and siltation.

The turbines and impoundment may act as barriers to fish movement and may lead to fish mortalities as a result of getting caught in the turbines themselves.

3.13.2 Local Perspective

Within the catchment there are three licensed abstractions to drive turbines. One of these is for the generation of electrical power for public supply and the other two are to drive saw mills.

There is one licensed abstraction for a water wheel for power generation. This is used to drive grinding equipment in a corn mill.

There are three licensed abstractions for driving water wheels for amenity purposes. If converted any of these three wheels could potentially be used for power generation. Their abstraction licences would need to be varied.

There are many mills, some derelict, throughout Cumbria. Some of these have the potential, once restored, to be used for power generation. The owners would, of course, need to apply to the NRA for an abstraction licence.

There may be a number of mills with water wheels which could be used for amenity or power generation purposes, which do not have a current abstraction licence. Wherever possible the NRA will strive to identify these operations and legitimise them.

3.13.3 Objectives

To facilitate hydropower developments where possible. To oppose hydropower developments which restrict the ability to use upstream resources unless appropriate mitigation can be agreed.

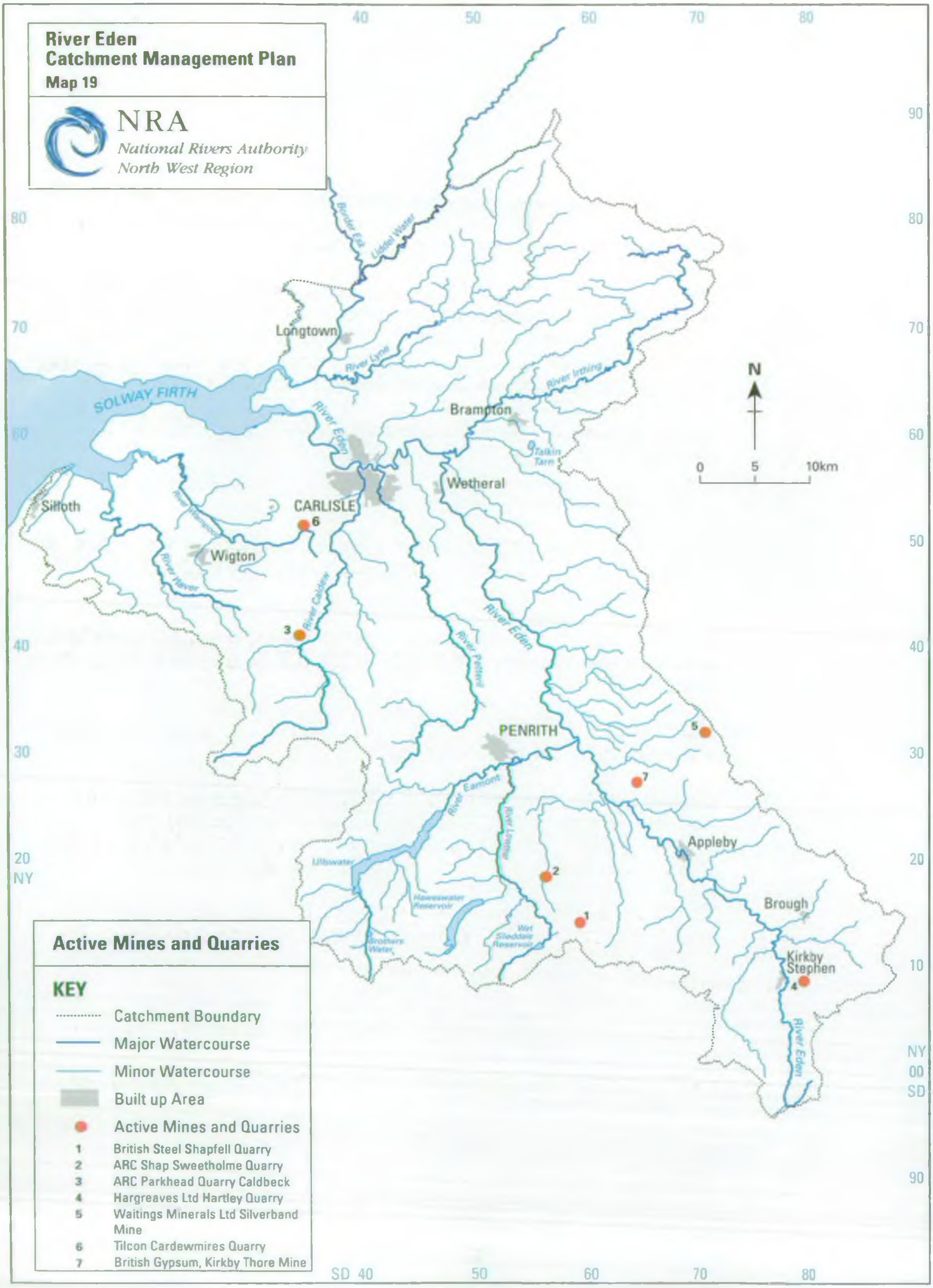
To ensure that discharge is made as close as possible to the point of abstraction, and that there is adequate residual flow for other water users in the derogated section of the river.

To ensure hydropower developments do not cause increased flood risk.

To ensure hydropower developments do not have adverse effect on Water Quality.

To ensure structures do not entrap fish or impact on fish habitat.

To ensure hydropower developments do not have an adverse effect on the ecology or amenity of the site.


River Eden
Catchment Management Plan
Map 19
NRA
National Rivers Authority
North West Region
Active Mines and Quarries
KEY
Catchment Boundary
Major Watercourse
Minor Watercourse
Built up Area
Active Mines and Quarries
1 British Steel Shapfell Quarry
2 ARC Shap Sweetholme Quarry
3 ARC Parkhead Quarry Caldbeck
4 Hargreaves Ltd Hartley Quarry
5 Waitings Minerals Ltd Silverband Mine
6 Tilcon Cardewmires Quarry
7 British Gypsum, Kirkby Thore Mine
SOLWAY FIRTH
Longtown
Border Esk
Liddel Water
River Lyne
River Irthing
Brampton
Talkin Tarn
River Eden
CARLISLE
Wetheral
Silloth
Wigton
River Wampool
River Waver
River Caldew
River Petteril
PENRITH
River Eamont
River Lowther
Ullswater
Haweswater Reservoir
Brothers Water
Wet Sleddale Reservoir
Appleby
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3.14 MINING AND QUARRYING

3.14.1 General

This use relates to the winning of minerals by either underground workings or surface excavations. Both these activities can have significant impacts on the water environment both during and after operations.

Quarrying and opencast mining can affect groundwaters by interfering with groundwater flows and removing layers of rock and soil which may otherwise provide protection by limiting or filtering infiltration. Closed and abandoned mines can impact on water quality by releasing acidic waters rich in metals from the former workings and associated spoil heaps. Such discharges are legally exempt from NRA control. Working mines and quarries may have a requirement to discharge effluent. Such discharges are controlled through NRA consenting procedures.

3.14.2 Local Perspective (see map 19)

There are 4 limestone quarries in the catchment. The stone from these quarries is used largely for roadstone or to produce lime for use in iron and steel manufacture.

There is an opencast mine near Knock where barium sulphate is extracted which us used for specialist purposes in the North Sea oil industry and paint and linoleum manufacturing.

There is a long history of deep mining for gypsum in the Eden Valley. Only one mine now remains and production is much reduced.

Similarly there is a long history of peat extraction from the raised mires in the catchment. Production is much reduced because of the overriding nature conservation value of the sites, and depletion of commercially valuable resources. Only two commercial extraction operations now remain.

There is also one gravel extraction operation near Carlisle. None of these operations currently cause significant problems for the water environment.

3.14.3 Objectives

To ensure no detriment to groundwater and surface water quality and quantity.

To ensure compliance by operators with the NRA's Policy and Practice for the Protection of Groundwater.

3.15 FISH FARMING

3.15.1 General

This use refers to the utilisation of surface and groundwater supplies for the commercial rearing of fish.

3.15.2 Local Perspective

There are six fish farms within the catchment five of which are on the Eden catchment, with one located on Ewes Water, a tributary of the Border Esk.

All the fish farms in England are subject to NRA control via abstraction licences and consents to discharge. In Scotland, the fish farm located on Ewes Water is subject to regulation by the Solway River Purification Board.

The farms produce a variety of fish for commercial purposes, ranging from salmon smolts destined to be grown on to adulthood in sea cages in Scotland, to rainbow trout for the table.

3.15.3 Objectives

To ensure compliance with discharge consents and abstraction licences.

To ensure provision of adequate screening arrangements to prevent escape of farmed stock.

4.0 ISSUES AND OPTIONS FOR RESOLVING THEM

4.1 INTRODUCTION

This section forms the hub of the plan and the issues described fall out of the analysis of uses and targets in the preceeding sections.

In the action plan which will be produced following consultation, this and the vision are the only sections of the plan which will remain in their present format. Consequently comments should be mainly addressed to this section of the plan.

Have all the major issues been identified?
Are there other options for resolving the issues?
Which option is likely to provide the best outcome?

Please use the response form provided at the back of the report.

4.2 ISSUES

4.2.1 Water Abstraction on the River Lowther and River Gelt

NWW plc are licensed to abstract water from the River Lowther system (including Haweswater Reservoir) under statutory powers obtained by Manchester Corporation Waterworks between 1919 and 1962. This includes a number of watercourses flowing across the Haweswater catchment which eventually feed the River Lowther. These abstractions cause significant environmental impact, but some improvements have already been obtained through the efforts of NRA, Lowther Estates and NWW. An operating agreement now exisit which has resulted in better management of the resources to allow increased migratory fish movement at certain periods of the year under certain flow conditions. Also improvements to the fish screens and the provision of fish ladders was implemented and further improvements planned.

Also on the River Gelt there is need to improve the water resource management of the present NWW plc abstraction. NWW are licensed to abstract up to 31 Mld from the River Gelt and adjoining springs, however a maintained flow of 6.8 Mld has been preserved. These conditions have remained unchanged since the Carlisle Corporation Water Act 1898. The present abstractions from the two main tributaries cause low flows during dry periods.

Both situations remain important issues and require further negotiations with NWW plc on abstraction management, structures and procedures, which will improve the problems. However, both abstractions are licences of right, which means the NRA has no legal power to force changes without paying considerable legal and compensation costs.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Do nothing	NWW /NRA	No cost	No improvement to derogated river lengths.
Consider channel improvements and better intake arrangements at the abstraction points.	NWW	Relief of derogated lengths of channel	Costs Are the water resources suitable to utilise these improvements.
Improve management of the resources i.e. seasonal controls and releases.	NWW /NRA	Targets ecological improvements to the catchment.	Loss of resource to NWW. More costly to operate.

Consider new Abstraction Licence conditions	NWW /NRA	Complete new base for considering the Abstraction Licence conditions.	Legal costs associated with re negotiation Abstraction Licences

4.2.2 *Gravel extraction on the River Eden and Esk Catchments*

The NRA removes gravel from rivers to improve hydraulic capacities and reduce the risk of flooding. To avoid conflict with fisheries and other nature conservation interests this work is done within strict time constraints and to an agreed method statement.

Other parties such as landowners and farmers may remove gravel for mineral purposes e.g. track surfacing erosion control or improving fish holding areas. Uncontrolled or poorly managed gravel removal can cause serious disruption to the river for example causing pollution, disruption to fish habitat and angling activity, discolouration of the river and varied effects on channel stability/capacity.

All such gravel removal on Main River requires Land Drainage Consent from the NRA and it is through this system that the NRA seeks to control gravel removal and prevent the problems outlined above. Historically significant problems have been caused on the River Eden and River Irthing from uncontrolled gravel extraction.

The designation of the River Eden and its tributaries as SSSI will affect procedures and operational activities.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Gravel Removal promoted by NRA Functions Removal by NRA after consultation with landowners, conservation, angling, and other river users.	NRA	Controlled, fully consented works carried out at agreed times and to the correct specification at minimum risk.	Costly, detailed consultation programme. Limited windows of opportunity to carry out works.
Do Nothing	NRA	No cost	Increased Flood Risk. Reduced Fisheries Habitats. Ineffective River gauging stations.

Gravel Removal promoted and carried out by other parties Removal of gravel by other parties with full consultation including Land Drainage Consent approval.	Third parties/NRA	Detailed planned operation with safeguards for the Water Environment. Gravel removal is done legally.	Ensuring compliance with all regulations and consultation with the necessary bodies. Enforcement by the NRA. Costly to the promoter.

4.2.3 River Eden at Appleby; Old Gas Works and Flood Risk to "The Sands" area.

The flood alleviation scheme which has been implemented during 1995 will help protect the Chapel Street Area of the Town. The defence level is designed up to a 1 in 100 year return period flood.

Part of the River Eden flood alleviation scheme at Appleby uses the former gas works wall as part of the defences. The site is contaminated with phenols, benzene's, cyanide, sulphates and other chemicals from the production of town gas on the site. Superficial groundwaters underlying the site are likely to be in hydraulic continuity with the river. Induced hydraulic heads could disturb the site and mobilise contaminants, although a surfacing of tarmac has been used to seal the ground. Responsibilities for removal of these dangerous chemicals lies with British Gas.

The area of the town known as "The Sands" remains vulnerable to flooding at a return period of 1 in 5 years and above. Consideration of possible flood alleviation measures including improved warnings will have to be investigated.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Old gas works issue Do nothing	British Gas	No Cost	Risk of pollution of the River Eden from the old gasworks site.
Demolish gas works site and decontaminate the site.	British Gas	Removes redundant structures and reduces pollution risk. Site can be developed.	Cost to British Gas

Retain site for Industrial Archaeological purposes but decontaminate the site, surrounding the structure.	British Gas/ Industrial Archaeological Trust	Heritage value of site retained. Risk of pollution minimised in decontaminated areas.	Cost to British Gas. Site value for redevelopment lost by British Gas. Some contamination may remain in situ.
<u>Remaining flood risk to Sands Area</u> Do nothing		No Cost	Remaining flood risk to vulnerable area.
Implement better Flood Warning system and individual property flood protection measures.	NRA/private property owners	Reduced risk of flood damage	Cost to NRA and individual property owners. Uncertain standards of protection achieved.
Full flood Alleviation Scheme to 1 in 100 year protection level.	NRA	Consistent Flood Defence standards in the town of Appleby Reduced damages.	Cost. Public opposition to the concept of a scheme.

4.2.4 Rivers Waver and Wampool Management Plan

The River Waver and River Wampool have, over the past 50 years, been altered and maintained to carry out purely drainage functions for their catchments. This has resulted in long lengths of canalised, uniform channels, devoid of any diversity either in the channels or the river corridors.

It is recognised that needs are changing and that these watercourses need to be closely examined with a view to re-introducing channel features, marginal habitats and river corridor diversity, whilst still maintaining an acceptable level of drainage. It is therefore the NRA's intention to formulate a ten year management plan for the two rivers, taking into account the interests of all NRA functions together with those of the local community and interested external organisations.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Produce and implement 10 year plan for management of the rivers and corridors.	NRA	Integrated strategy for the benefit of flood defence fisheries and conservation interests.	Costs of consultation and doing the work.

4.2.5 River Caldew/Little Caldew Management Plan

Flood defence, water resources and conservation issues have arisen on the River Caldew/Little Caldew in Carlisle. There is the long term concern of gravel accumulation within the main channel of the River Caldew as it passed through Denton Holme. This increases the urban flood risk because of channel capacity is lost. Regular gravel removal is carried out after consultation and approval by fisheries and conservation bodies. However, the frequency of the need to remove the gravel needs to be determined for economic and conservation reasons.

On the Little Caldew there is need to address the issue of the inlet control at Holmehead weir and investigate the downstream problem were the mill stream re enters the River Caldew during flood conditions. Three abstraction licences still exist on the Little Caldew, and any inlet control considerations will need to be investigated to maintain this resource.

Also much of the upstream end of the Little Caldew is changing from industrial to housing land use and this will also be considered in the Management Plan.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Do nothing	Nil	No cost	Flood defence, water resources, conservation matters not considered.
Draw up management plan and implement an action plan.	NRA	All water environment features considered with a satisfactory plan as an objective. Flood defence revenue savings. ensured water resources for abstraction licences. fisheries and conservation interests promoted.	Costs Opposition from land owners.

4.2.6 Flood Alleviation Issues Highlighted by January 1995 floods

As a result of serious flooding in January/February 1995 the following areas have been highlighted as flooding issues.

River Eden	Low Crosby
River Eden	Willowholme Industrial Estate
River Eamont	Eamont Bridge
River Petteril	Flood banks behind Carlisle Rugby Club
River Eden	Warwick Bridge

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Do nothing	NRA		Continuing flood risk
Investigate the issues and consider options for providing a recommended solution within 2 years	NRA	Existing flood defence will be brought up to acceptable levels of protection if they prove to be economically and environmentally acceptable.	Opposition from some 'Stakeholders'.

4.2.7 Thacka Beck Culvert in Penrith

Thacka Beck is culverted for long lengths under Penrith Town Centre. Some of the culvert is many years old and in poor structural condition. Eden District Council and Cumbria County Council have replaced long lengths of culvert in recent years. However certain sections remain susceptible to collapse which could lead to flooding of properties.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Use NRA assessment report to move forward with improvements.	NRA	A viable engineering report is available for hydraulic and structural design purposes.	
Encourage riparian owners to repair/replace dilapidated lengths of culvert.	CCC/EDC Riparian owners	Acceptance of responsibility by various owners.	Organising a co-ordinated response with financial backing
NRA take over responsibility for all the culvert structures	NRA	Fully consented and structurally sound culvert.	Ongoing maintenance costs. Precident problem.
Do nothing			Risk of collapses in culvert leading to flooding in Penrith Town Centre.

4.2.8 *Main River Policy in Urban Areas*

Over recent years there has been a steady switch of emphasis on NRA Revenue and Capital works from the rural areas to providing protection of urban areas where flooding is likely to occur. However, many lengths of these urban watercourses are 'non-main' meaning that the NRA Flood Defence Section has no permissive powers to carry out maintenance or capital works to relieve any flooding problem or control further development which could increase flood risk.

Currently the District Councils are the Drainage Authority and due to limited resources restricted powers are unable to fully manage all Flood Defence aspects.

It is intended to review many urban watercourses within the River Eden CMP area so that a schedule of 'maining' can be implemented in the future if appropriate.

The watercourses are largely in Carlisle, Penrith, Wigton and Brampton.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Do nothing	District Councils		Flood risk in the identified urban areas remains
Identify watercourses that are currently 'non-main' rivers in urban areas and consider 'maining' where appropriate..	NRA	Reduced risks of flooding to identified urban areas. Greater customer awareness of flood defence works.	Costs, Revenue and Capital.

4.2.9 *Failure to meet EC Freshwater Fisheries Directive Standards in the River Petteril at Flusco*

Upper Flusco quarry landfill site was not constructed on containment principles and consequently leachate is able to migrate via faults, fissures and bedding planes in the surrounding limestone and enter Millrigg Beck, a tributary of the River Petteril. Impact on the river system is seasonal and erratic and is greatly influenced by the hydraulics within the landfill site. The hydrogeological dynamics of groundwater flow in the limestone strata will suffer from continual change as a consequence of quarring activities on the adjacent site. The leachate has caused occasional high levels of ammonia in the River Petteril leading to failure of the Fisheries Directive Standards.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Tanker leachate away more frequently	CCC (WDA)	Short-term reduction of leachate level thereby reducing hydraulic head and driving force of migration.	Intermittent management, Costly, ineffective.
Connect to foul sewer	CCC (WDA)	Constant leachate level management reduction in leachate head. May be cheaper than tankering in the long term.	Question of wayleaves to build the sewer. High cost of construction..
Dose Millrigg Beck with hydrogen peroxide	WDA/ NRA	Effective - worked in the past, cleared fungal growths, low maintenance	Question of wayleave. Not tackling source of problem. Possible health and safety concerns.
Seal various areas to stop leachate escaping and redirect to sump	WDA	Prevents overland flow to lower quarry. Reduces hydraulic loading on areas which are segregated from main leachate collection areas.	Transfers problem from one area to another.

Await results of recently commissioned hydrological/hydrogeological assessment for lower flusco.	Cumbria Waste Management	Better understanding of groundwater system and different options	Allowing discharge to continue (seasonal variance)

4.2.10 Pollution of Ditch by Sewage at Sandford, Near Appleby

Sewage from Sandford village which is predominately untreated, discharges by way of a drain to an open ditch about 50 metres upstream of the ditch's confluence with the Eden. Little dilution is afforded by this ditch (which is crossed by a public footpath) hence the water is usually adversely affected by sewage debris and discolouration. The effect on the Eden is restricted to around the confluence but quickly disperses.

North West Water undertook in the late 1980's to provide primary treatment for Sandford sewage and a small number of other similar discharges in the Eden area, (including Glassonby and Little Salkeld). However, while the other matters were dealt with in this way, wayleave problems delayed the Sandford project. In 1993 NWW decreed that money should not be spent on this type of scheme, rather it would be allocated to existing works which were struggling to comply with their effluent consent standards.

The situation at Sandford therefore remains at the present day with the ditch still being contaminated by sewage.

Since then, the NRA have objected to proposed residential developments in the village in order not to exacerbate the problem.

Despite Sandfords exclusion from NWW's current investment plans (AMP2) the NRA are continuing to press for an early resolution to this problem, and are currently negotiating with NWW with a view to achieving this.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
1) Continue to press NWW to provide treatment.	NRA/NWW	Achieve Water Quality improvement. Remove nuisance (NRA and Env. Health).	

2) Pump sewage to Warcop S.T.W.	NWW	1) Achieve water quality improvement. 2) Remove one discharge entirely.	High cost could be prohibitive.
3) Do nothing	NRA/NWW	Money available for other schemes	Existing problem remains. Remains the only known NWW sewerage systems, discharging to inland waters with no treatment.

4.2.11 Impact of Discharges from combined sewerage systems

Sewers on the catchment are largely combined with both foul and surface waters (road drainage etc.) being transported in the same sewer for treatment at Sewage Treatment Works (STW's).

Combined Sewer Overflows (CSO's) are located on sewers or at pumping stations and discharge to watercourses. They are designed to prevent foul flooding by relieving the sewerage network of excess flows during storm conditions. When properly designed and constructed they should only operate when there is adequate dilution available in the receiving watercourse. There are also sewer overflows at some STW's where there may be some treatment given to the storm sewage.

Thirty three of the 136 CSO's on the catchment have been identified as unsatisfactory by the NRA and highlighted to North West Water.

The NRA in conjunction with NWW, have prioritised the list of unsatisfactory CSO's on a cost benefit basis. The money available to NWW to rectify these problems is largely controlled by the Office of Water Services (OFWAT) who are the financial regulator of the water industry. With the money available NWW have a planning horizon of about 10 years and this investment plan is known as Asset Management Plan 2 (AMP2).

Work Planned within AMP2

Work to rectify some of the most significant problems on the catchment has been confirmed and is outlined below.

a) Storm overflow from Carlisle STW

Although this overflow is not covered by AMP2, NWW have indicated that its uprating wil be within the AMP2 timescale.

Solid debris has passed into the River Eden during storm events, causing nuisance and aesthetic problems downstream. Discussions between NWW and NRA will go ahead shortly to determine the scope and exact timing of improvement works.

b) Catholic Lonning/Strand Road CSO's in Carlisle

The Catholic Lonning overflow in particular operates prematurely and causes aesthetic problems in this highly visible location. These 2 CSO's will be replaced with a new CSO incorporating improved screening arrangements. This scheme is currently programmed for completion in early 1997.

c) Warwick Road pumping station overflow in Carlisle

This overflow operates more frequently than the design criteria and the outfall discharges to a backwater of the River Petteril. A capital scheme involving upgrading of the pumps and relocation of the outfall is currently programmed for completion in early 1997.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Ensure agreed investment plans at Carlisle STW, Catholic Lonning, Strand Road and Warwick road are implemented.	NRA/ NWW	Reduced aesthetic problems in rivers	
Continually review the list of unsatisfactory CSO's and promote further problems into the NWW investment programme should additional money become available.	NRA	Solution ready if further funding becomes available	

Recommend refusal of future planning applications for development in critical areas.	NRA/Local Planning Authority	Prevent deterioration's	

Problem CSO's outside the AMP2 investment plan

The remaining unsatisfactory CSO's are not due to be addressed within the AMP2 period so in theory will remain in their present condition until at least 2005. However, the NRA will continually review the list of unsatisfactory CSO's to ensure it is in priority order. In addition every opportunity will be taken to rectify problems as soon as possible and promote projects into the AMP2 investment plan.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Continue discussion with NWW to promote high priority projects into the AMP2 investment programme. Present priority listing:- Bousteads Grassing CSO, Carlisle Brougham Bridge CSO, Penrith Scotby CSO's CSO's within Wigton	NRA/ NWW	Opportunities to achieve further improvements can be readily taken up.	
Continue reviewing the list of unsatisfactory CSO's to ensure it is in priority order.	NRA	Any money spent will provide the best possible benefit to the environment.	
Recommend refusal of future planning applications for development in critical areas.	NRA Local Planning Authority	Prevent deteriorations.	

4.2.12 Pollution from farm effluent

Polluting agricultural discharges are a major problem in this largely rural catchment. The discharges may be accidental spillages of slurry or silage effluent or may diffuse pollution caused be a number of minor discharges or run off from land.

The only failures to meet water quality objectives which are attributed to agriculture occur on Bampton Beck, a tributary of the River Wampool. The NRA intends to investigate this stretch of river, find the cause of the problem and eliminate any illegal discharges.

The exact nature and timing of action to improve water quality will depend on the outcome of these initial investigations which will be undertaken in 1996.

The introduction of the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991, has ensured the NRA take a more pro-active role by requiring all new farm structures be built to a specific high standard. Until recently grant aid was available to farmers to install pollution prevention structures but this grant aid has now been withdrawn by MAFF. The Code of Good Agricultural Practise and confidential free advice from ADAS provide guidance on minimising the risks of pollution.

The NRA welcomes recent efforts by the farming community to improve effluent control and will continue to work with farmers, ADAS, MAFF, the NFU and the agricultural colleges to seek further improvements in the immediate and longer term. Where specific areas are highlighted as needing specific improvement the NRA will mount campaigns and farm inspections. The NRA supports the principle of buffer-zones of semi natural vegetation to help reduce agricultural run off into rivers.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Liaise with farmers ADAS/MAFF, NFU and others	NRA Farmers MAFF/ ADAS NFU Others	Maintain high profile and focuses effort on critical areas.	Message becomes too familiar and risks being ignored.

Continue current pollution control initiatives.	NRA ADAS Farmers Others	Maintain and improve water quality. Increase awareness of farming community.	Message becomes too familiar and risks being ignored.
Implement control of pollution regulations and take enforcement action where necessary.	NRA Farmers	Maintain and improve water quality increase in security of farm infrastructure.	Prosecutions may alienate farmers from NRA.

4.2.13 Lack of rural sewerage leading to localised pollution

Lack of rural sewerage systems has led to a multiplicity of private septic tanks and treatment plants in some areas. This makes control difficult and has led to localised pollution. Particular problems have occurred at Crosby Ravensworth and Maulds Meaburn.
In general these systems are perfectly legal and the NRA cannot force significant improvement on its own. To achieve improvements the NRA must work with Local Authorities, NWW and others.

The failure to meet water quality objective in Highberries Beck and Brunstock Beck are thought in part to be attributed to a lack of sewerage in the Laversdale Lane End Area.

The present list of the top 8 problem areas in approximate priority order is:-

	Village	**Receiving Watercourse**
1.	Glenridding (part of)	Glenridding Beck
2.	Crosby Ravensworth Maulds Meaburn	Dalebanks Beck/Lyvennet Beck River Lyvennet
3.	Crosby Garrett (part)	Crosby Garrett Beck
4.	Aikton	Tributary of Bampton Beck
5.	Great Strickland	Tributaries of the River Leith
6.	Great Asby	Asby Beck
7.	Laversdale Lane End	Tributary of Highberries Beck.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Pursue all opportunities to promote adoption of first time rural sewerage by NWW, Local Authorities or other bodies.	NRA NWW Local Authorities Others	Reductions in pollution	Unlikely to be significant progress in the short term.
Establish a system for minimising the impact of small sewage treatment systems	NRA	Reductions in pollution	
Influence local development through liaison with Local Planning Authorities (LPA's)	NRA LPA's	Prevent deterioration	Long standing problems will remain.

4.2.14 Impact in UCB Films effluent discharge on the River Waver Estuary

UCB Films Factory at Wigton discharge effluent to the River Waver Estuary via a long pipe. Since commissioning of the new effluent treatment plant in 1994 the overall quality of the effluent has improved. However, due to biological activity in the pipeline the effluent is black and septic at the outfall to the estuary. The pipeline is classed as a public sewer which NWW control and extensive works may be required to improve the discharge.

Negotiations are continuing between NWW, UCB Films, HMIP and NRA in order to find options for solving the problem.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Implement a staged strategy:- 1) Seek further improvements to effluent quality to ensure consent compliance at discharge estuary.	NRA/ HMIP	Achieve immediate water quality improvements.	Changes in effluent quality may still take place within the sewer.
2) Revoke NRA Consent and control the discharge via HMIP authorisation at the factory.	NRA/ HMIP	UCB Films not responsible for discharge to estuary. Negotiation can then be with NWW. Responsibility is rationalised.	Problems in estuary remain until NWW can be convinced to take responsibility.
3) Take legal action against UCB Films and/or NWW	NRA	Bring the situation to a head.	May not succeed and the problem remains in the interim.
4) Establish long term objectives for waver and implement revised strategies	NRA UCB Films NWW	Achieve long term needs of the estuary.	

4.2.15 Fisheries Management Plan

A number of anglers and interested parties have expressed concern about the status of sea trout, brown trout, coarse fish and spring run salmon stocks in the area. These concerns are often based upon poor individual catches and/or the absence of visible fish. Often the assumption is made that reduced catches are due to smaller stocks of fish being available. A good knowledge of fish stocks and the factors which affect them is essential for the NRA to maintain, improve and develop fisheries effectively.

To address these concerns and create a structured overall approach to fisheries management in the area, an Eden and Border Esk Fisheries Management Plan is to be produced.

The plan will improve the flow of information, allow an exchange of views and will be the subject of substantial consultation with all interested parties. The plan will establish and agree actions to maintain and improve the fishery.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Produce a fisheries management plan to create a structured overall approach to fisheries management in the area. Relate plan to both local issues and National R & D investigations. Consult and publicise widely	NRA	Establish a comprehensive and cohesive strategy for fisheries management in the area involving the Eden and District Fisheries Association and other interested parties.	

4.2.16 River Eden Coarse Fish Investigation

In 1993 following concerns expressed by interested parties over the coarse fish population in the lower Eden the NRA, began investigations into the dace population of the river. Work to date has included electric-fishing and netting of the main river and many of its tributaries. A limited amount of radio tracking work has also been undertaken. Stocking of 5000 ,marked dace into 4 locations in the Lower Eden took place in Spring 1995.

The investigation seeks to gain information on fish movement, population, size, growth rates and other factors with the aim of improving the stocks overall.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Complete investigations into coarse fish stocks of lower River Eden including stockings of tagged Dace, report findings and propose action to conserve stocks.	NRA	Provides information on coarse fish stocks with aim of improving and developing stocks.	
Assess and report on operation of coarse fish pass on River Petteril in Melbourne Park	NRA	Improves access for all fish in Petteril system. Provides information on fish stocks in River Petteril	

4.2.17 Rod and Line Catch Returns

Anglers who fish for salmon and sea trout are required to submit catch returns detailing numbers and sizes caught. In recent years a record of fishing effort has also been asked for. Historically only a minority of anglers have submitted returns. This has led to under representation of the importance of migratory salmonid fisheries on almost all our rivers. It is vital that a representative and accurate picture of catches is obtained in order to monitor trends effectively.

Detailed information concerning catch and effort can be obtained from log books. A log book scheme has been in operation in the area since 1992.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Complete National R & D project into use of catch statistics to determine fish stock size.	NRA	Evaluates catch statistics in relation to management of fish stocks and determines how they can be used to estimate stock size.	
Continue operation of anglers log book scheme	NRA/ Anglers and Asso-ciations	Provides management information in catch related to fishing effort, methods and flows.	

4.2.18 Fish Stocking Activity

Some parties in the area are calling for greater stocking effort by the NRA. There is a need for greater awareness of the possible consequences of stocking both in terms of its effect on the wild fish populations and the likelihood of improvement to stocks.

Following completion of strategic surveys of juvenile stocks comparison between different sites, river systems and years will provide a picture of those areas that are performing well and those that are not.

Nursery streams are being assessed to determine their suitability for restocking, including the numbers of fish to be stocked. The NRA is also reviewing its current stocking practice. The aim of this work is to ensure that restocking is carried out where and when appropriate utilising the optimum number of fish.

The NRA has decided nationally to target its restocking effort on mitigation and restoration work. In this area the main activity will be assisting fisheries to recover from recent damage which is most likely to have been caused by pollution.

Historically much of the stocking carried out by the NRA has been for the enhancement of natural populations. This type of activity will be discontinued as it is not cost beneficial and can damage the existing natural population.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Review and report on current stocking practice	NRA	Provide management information in most appropriate life history stage of fish to be utilised for restocking.	
Complete National R & D Project to examine effectiveness of salmonid stocking strategy.	NRA	Aims to identify most effective strategies for stocking migratory salmonids in order to maximise returns of adult fish to fisheries.	

4.2.19 Fisheries Survey Data

Prior to 1992 surveys were carried out usually in response to problems that had been highlighted. Since 1992 there has been a programme of planned, strategic surveys designed to obtain information on juvenile fish stocks. Where appropriate, surveys designed to address specific issues will still be undertaken.

In addition every year, redd counts are undertaken to produce a record of spawning activity. This activity is very dependent on good weather and flow conditions.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Undertake strategic survey of juvenile fish stocks.	NRA	Provides detailed data on status of juvenile stocks. Provides a picture of areas that are performing well and those that are not.	
Follow up investigations on areas of concern (low fish populations) identified in strategic surveys of juvenile fish salmonids.	NRA	Provides information that assists in identification of potential causes for poor fish stocks.	

4.2.20 Lack of Information on Fish Habitat Quality

Few fisheries habitat improvements have been carried out on the catchment since in the main, habitat for fish was thought to be in a reasonable condition. However a number of localised problems are known to exist and the NRA intends to undertake a survey to identify areas where physical habitat rehabilitation may be appropriate.

Such a survey will not only consider the nature of any problems which may exist but will also give some insight into the size of the problem.

In the shorter term there will be a need to carry out pilot schemes aimed at evaluating improvements which could be made before embarking on any larger scale schemes which may appear appropriate.

One of the key issues which would need to be resolved is the source of the finance which would be required for such projects.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Undertake survey of fish habitat in the area and report.	NRA Riparian Owner	Information will enable improvement work to be targeted effectively.	Expensive and consu,ing of already heavily committed staff.
Carry out pilot improvement projects.	NRA Riparian Owners	Specific improvements are able to be evaluated and costed.	

4.2.21 Net Limitation Order on Solway

Haaf netting for migratory salmonids in the English part of the Solway is currently the subject of a net limitation order. This has been in operation since 1987 and the current order sets the maximum number of licences which can be issued to 165 in any year.

The exiting order expires in 1997 and it will be replaced either with a new order or with a situation in which an uncontrolled number of licences is issued, with licences available on demand.

The progression of this matter falls to the NRA and during the review process consultation with interested parties will take place.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Review Solway Net Limitation Order	NRA	New appropriate order in place when current order expires	
Do nothing			Unregulated fishing. No limitation order in place on expiry of current order

4.2.22 Timing of Salmon and Sea Trout Fishing Seasons

Anglers, Angling Association and other interested parties have expressed a desire to consider changing the annual close seasons for salmon and sea trout. The NRA has made recommendations to the Ministry of Agriculture, Fisheries and Food for changes in the sea trout close season. This, and other byelaw recommendations are currently (April 95) with MAFF and a response is awaited. NRA Fisheries byelaws are reviewed on a 3 yearly basis. It is the NRA's intention to consider the salmon close season during the next byelaw review. Consultation with fisheries interests will form a major part of the review process.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Consider salmon season as part of next NRA Fisheries byelaw review.	NRA/ MAFF	Review of situation in relation to salmon spawning and protection measures deemed necessary. Enables views of anglers and interested parties to be taken into consideration.	

4.2.23 Illegal exploitation of Salmonids in Inland and Coastal Waters

Illegal fishing in rivers and lakes can be a highly organised and commercially motivated activity. Methods include the use of nets, gaffs, snares and hands as well as the occasional use of poisons and even explosives.

Enforcement of fisheries legislation on the rivers will continue to be given a high profile. A substantial number of people have been apprehended and convicted for fisheries offences. Information received from anglers about illegal activities has been very helpful in recent years.

There is concern that some sea fishermen are illegally exploiting migratory salmonids in Cumbria coastal waters.

A legal sea fishery exists in coastal waters using drift nets and beach nets mainly to catch mullet, cod, flatfish and bass. This fishery is regulated primarily by Cumbria Sea Fisheries Committee, although the NRA has prosecuted sea fishermen for taking migratory salmon illegally.

Under the Sea Fisheries Regulation Act 1966 and the Salmon Act 1986 it became possible to introduce byelaws to try to minimise the interference by the sea fishery to migratory salmonids in coastal waters. In this instance the byelaws were made by the Cumbria Sea Fisheries Committee and agreed jointly with NRA. The byelaws which have recently been introduced regulate the placing and use of drift and fixed nets (for sea fish) throughout the year. Particular protection is given by these byelaws to the areas around the mouths of the catchments salmon rivers, and to the upper Solway.

In relation to enforcement activity the NRA will continue to liaise with the Scottish and English Police, Local District Fishery Boards (Annan & Nith) and the Procurator Fiscal as appropriate.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Maximise effectiveness of anti-poaching enforcement through best deployment of staff, use of part time assistance and liaison with private fisheries interests and the Police. Ensure prosecutions are taken as necessary.	NRA/Owners, Anglers, Police, Scottish District Fishery Boards Procurator Fiscal	Efficient and effective protection of fish stocks. Deterrent effect.	
Monitor effectiveness of new Sea Fisheries Byelaws in protecting migratory fish, and liaise with Cumbria Sea Fisheries Committee in relation to enforcement.	NRA Cumbria Sea Fisheries Committee Scottish Agencies	Protection of fish stocks in coastal waters	

4.2.24 River Eden Site of Special Scientific Interest (SSSI) designation

The River Eden is in the process of being notified by English Nature as a SSSI, as one of the best examples of a sandstone and limestone river in Britain. It is also a proposed river Special Area of Conservation (SAC) under the EC Habitats and Species Directive.

Notification of the SSSI is being carried out in close consultation with the NRA. English Nature is using our 1991 strategic river corridor survey to provide background information.

Once notified as a river of national importance the River Eden will have been made a priority for the NRA to protect its wildlife and natural features. A Special Ecosystem classification is being developed by the NRA for setting water quality objectives.

Once the SSSI is designated there is a theoretical need for members of the public to consult both English Nature and NRA for permission to carry out certain operations which affect the river and this is termed dual consenting.

The NRA and English Nature are currently negotiating with a view to reducing bureaucracy and streamlining the process so that dual consenting is not necessary.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Negotiate "dual consenting" procedures for the SSSI	NRA English Nature	Streamline consultation and workload on operations and authorisations affecting the SSSI Reduced costs. Imporved service to customers.	
Ongoing liaison with English Nature	NRA English Nature	Dove tailing of policies to the benefit of the river.	

4.2.25 Protection of Native Crayfish (Austropotamobius pallipes)

Great Britain has a single native species of crayfish - the white clawed or Atlantic stream, crayfish, which is protected under the Wildlife and Countryside Act, 1981. The upper Eden catchment is a stronghold for this species and the importance of this area in national terms is becoming more and more clear.

During the 1970's American signal crayfish (*Pacifasticus Leniusculus)* were brought to Great Britain for farming for the table. As the signal crayfish is able to escape from all but the most sophisticated enclosures and to travel overland for considerable distances, subsequent escapes have ensured a widespread distribution in England and Wales.

Signal crayfish carry "crayfish plague" to which they are resistant, but our native species have no resistance whatsoever and all individuals in a river will die within days of infections being introduced. This has happened in many southern rivers where the native crayfish is either extinct or faces extinction.

To protect the species MAFF are proposing a series of no-go areas for non-native crayfish, and the whole of North West Region is included.

The NRA supports action to protect this protected and endangered species and will work in conjunction with MAFF and English Nature in an effort to safeguard the populations in the catchment.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
NRA supports MAFF proposal no go area for introduction of signal crayfish.	MAFF	Crayfish plague not introduced to Northern Britain and our protected native species is safeguarded.	
Opportunity for project to establish distribution of native cray fish in catchment.	NRA EN	Obtain detailed information in population distribution and status to allow rational management decisions.	
Produce Management action plans with the objective of safeguarding important natural populations of crayfish	EN NRA	Activities in the catchment will be able to be continued without damaging the resource.	

4.2.26 Fish Eating Birds

There is a perception amongst some anglers that cormorant and goosanders are increasing in the Eden Catchment Plan area leading to reduced fish numbers.

Cormorants and goosanders are fully protected in Great Britain under the Wildlife and Countryside Act 1981. The Act makes provision for the killing of birds by licensed shooting, for the purposes of preventing serious damage to fisheries where no other satisfactory solution can be found.

The current NRA position, is one of not supporting killing unless and until serious damage to fisheries has been established and killing proved an effective means of preventing that damage. The NRA accepts that it may be possible to obtain adequate evidence in a case by case basis of individual fisheries and it will work positively with owners and anglers to establish the full facts in each situation. Where the damage is proven to be economically significant the NRA will support the giving of licences.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
NRA supports granting of licences to cull fish eating birds on fishery protection grounds.	MAFF/ NRA	Protection of fish numbers	Duty to conserve protected species may be compromised.
NRA rejects granting of licences to cull fish eating birds on bird conservation grounds.	MAFF/ NRA	Protection of protected species of bird.	NRA fisheries duties may be compromised.
Present stance of not supporting bird shooting until serious damage to fish stocks is proven after establishing the full facts of the situation.	MAFF/ NRA	Working compromise to protect both fish stocks and protected bird species in the light of adequate management information	

Support research initiatives which will improve knowledge of the impact of fish eating birds on fish populations	MAFF EN NRA	High quality objective decisions about the justification for controlling bird numbers will be possible.	

4.2.27 Status of the otter (Lutra Lutra) in the catchment

After the devastation of Britain's otter population in the 1950's and 60's there is good evidence for a continuing recovery in Cumbria.

Protected under the Wildlife and Countryside Act, 1981, the otters stronghold in Cumbria are rivers within the Eden Catchment Plan area, such as the Border Esk, Irthing and lower Eden.

From these strongholds, there are signs of a two pronged expansion of the population, one continuing into the upper Eden and the other spreading around the Solway onto the Wampool, Waver and Ellen. Whilst the upper Eden offers excellent otter habitat, large sections of the Waver and Wampool have been denuded of suitable habitat, due to previous unsympathetic river management. Establishing a thriving population on the Solway Plain will provide the species with access to other rivers in West Cumbria which offer excellent habitat but currently support few otters.

To this end, in 1995 the NRA and the Cumbria Wildlife Trust are undertaking a collaborative project aimed at enhancing the available otter habitat in the Waver and Wampool.

Elsewhere the NRA will continue to supply otter sign information collected during routine activities to the Cumbria Wildlife Trust for collation and interpretation.

These actions are consistent with the NRA's National Strategy on Otter Conservation which require the NRA to:

Monitor/Protect Stronghold:

Protect existing otter strongholds by (i) ensuring that current management practices maintain suitable conditions and (ii) low-level monitoring of otter distribution.

Monitor/Encourage Re colonisation:

In areas near strongholds, protect and improve conditions specifically for otters (e.g. where appropriate, building artificial holts) over and above general river enhancement works.

Monitor as Resources Allow:

In areas remote from otter strongholds continue river enhancement works to improve conditions for wildlife generally, but where resources are limited, expend no special extra effort such as building artificial holts.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Monitor for otter signs during other routine activities.	NRA	Continuation of monitoring began by otters and rivers project.	
Undertake collaborative project to enhance otter habitat on Rivers Waver and Wampool	NRA Cumbria Wildlife Trust	Evidence of recent active colonisation into rivers with denuded otter habitat. Securing population here will provide bridgehead into West Cumbria	Capital Cost

4.2.28 Promotion of access to water for recreation

Recent consultation in the North West has indicated that active promotion of water based recreation by the NRA would be a highly contentious issue with some interests very much for the adoption of such an approach. On the other hand numerous parties are completely against such a move. Opposing views are strongly held, particularly in the Lake District.

Opportunities will arise to bring interested parties together to further recreation and this approach is likely to be less problematic.

One of the most problematic areas in the resolution of the competing interests of anglers and canoeists. The NRA will attempt to bring these groups together where they jointly indicate an interest in resolving their differences.

OPTIONS	*RESPON-SIBILITY*	*ADVANTAGES*	*DISADVANTAGES*
Make a determined attempt to increase access to water for recreational purposes.	NRA Local Authorities Site Owners Sports Council Water Sports user groups.	More water and waterside areas used for recreation. Increased awareness of aquatic issues.	Areas of quiet refuge decrease. More conflict between sports. More conflict between conservation and sports. Legal access problems will be highlighted.
Take opportunities to bring interested parties together to further recreational opportunities.	NRA Local Authorities Sports Council	Solutions to problem may be facilitated. More shared use of resources.	

APPENDICES

APPENDIX 1 GENERAL QUALITY ASSESSMENT (GQA), CHEMICAL GRADING FOR RIVERS AND CANALS

Water Quality	*Grade*	*Dissolved Oxygen*	*Biochemical Oxygen Demand (ATU[1])*	*Ammonia*
		(% stauration) 10 - percentile	*(mg/l) 90 - percentile*	*(mgN/l) 90 percentile*
Good	A	80	2.5	0.25
	B	70	4	0.6
Fair	C	60	6	1.3
	D	50	8	2.5
Poor	E	20	15	9.0
Bad	F[2]			

1. As suppressed by adding allyl thio-urea

2. i.e. quality which does not meet the requirements of grade E in respect of one or more determinands.

APPENDIX 2 NATIONAL WATER COUNCIL (NWC) CLASSIFICATION SCHEME WATER QUALITY CLASSES FOR ESTUARIES

Description	*Points awarded if the estuary meets this description*
Biological Quality (scores under a,b,c & d to be summed)	
a) Allows the passage to and from freshwater of all relevant species of migratory fish, when this is not prevented by physical barriers.	2
b) Supports a residential fish population which is broadly consistent with the physical and hydrographical conditions.	2
c) Supports benthic community which is broadly consistent with the physical and hydrographical conditions.	2
d) Absence of substantially elevated levels in the biota of persistent toxic or tainting substances from whatever source.	4
Maximum number of points	10
a) Estuaries or zones of estuaries that wither do not receive a significant polluting input or which receive inputs that do not cause significant aesthetic pollution.	10
b) Estuaries or zones of estuaries which receive inputs which cause a certain amount of pollution but do not seriously interfere with estuary usage.	6
c) Estuaries or zones of estuaries which receive inputs which result in aesthetic pollution sufficiently serious to affect estuary usage.	3
d) Estuaries or zones of estuaries which receive inputs which cause widespread public nuisance.	0
Water Quality (Score according to quality)	
Dissolved Oxygen exceeds the following saturation values:	
60%	10
40%	6
30%	5
20%	4
10%	3
below 10%	0
The points awarded under each of the headings of biological, aesthetic and water quality are summed. Waters are classified on the following scale.	
Class A Good Quality 24 to 30 points. Class C Poor Quality 9 to 15 points	

APPENDIX 3 RIVER ECOSYSTEM CLASSIFICATION: WATER QUALITY CRITERIA

Class	Dissolved Oxygen % Saturation 90 percentile	BOD (ATU) mg/l 90 percentile	Total Ammonia mg N/l 95 percentile	Un-ionised Ammonia mgN/l 95 percentile	pH lower limit as 5 percentile; upper limit as 95 percentile	Hardness mg/l Ca CO_3	Dissolved Copper ug/l 95 percentile	Total Zinc ug/l 95 percentile
RE1	80	2.5	0.25	0.021	6.0 - 9.0	<10 > 10 and <50 >50 and <100 >100	5 22 40 112	30 200 300 500
RE2	70	4.0	0.6	0.021	6.0 - 9.0	<10 >10 and <50 >50 and <100 >100	5 22 40 112	30 200 300 500
RE3	60	6.0	1.3	0.021	6.0 - 9.0	<10 >10 and <50 >50 and <100 >100	5 22 40 112	300 700 1000 2000
RE4	50	8.0	2.5		6.0 - 9.0	<10 >10 and <50 >50 and <100 >100	5 22 40 112	300 700 1000 2000
RE5	20	15.0	9.0					

APPENDIX 4 EDEN CATCHMENT MANAGEMENT PLAN

The following stretches were originally designated as Class 1A (RE1) under the old NWC Scheme. However, a Long Term Objective of Class RE2 Class 1B) is considerd to be more appropriate. This proposal reflects improved data on the quality of these watercourses and does not imply any deterioration.

River Name	*Stretch Name*	*Upstream NGR*	*Downstream NGR*	*Long Term Objective*	
				1979 Target	*1995 Target*
Holme Dub	QSL Mealrigg to Crummock Beck	NY 1320 4600	NY 1740 4930	1	2
Langrigg Beck	QSL Sandraw Beck to Holme Dub	NY 1730 4570	NY 1590 4770	1	2
Sandraw Beck	QSL All Hallows to Langrigg Beck	NY 1930 4300	NY 1733 4577	1	2
Thornthwaite Beck	QSL Above Thornthwaite to Waver	NY 2840 4070	NY 2660 4410	1	2
Wampool	QSL Priests Brow to Whinnow Beck	NY 3210 4150	NY 2900 5035	1	2
Boston Beck	QSL Low Ling to Wampool	NY 3130 4650	NY 3092 4950	1	2
Eden	Petteril to Willowholme STW	NY 4110 5640	NY 3842 5656	1	2
Eden	Belah to Appleby STW	NY 7700 1245	NY 6753 2100	1	2
Roe Beck	QSL Starth Hill to Caldew	NY 4070 3610	NY 3830 4730	1	2
Ive	QSL at Low Braithwaite to Roe Beck	NY 4290 4210	NY 3970 4350	1	2
Summergroun d Gill	QSL Reservior to Petteril	NY 4170 3090	NY 4460 3080	1	2
Hell Beck	QSL at Talkin Tarn to Gelt	NY 5460 5920	NY 5299 5840	1	2
Quarry Beck	QSL Whinney Fell to Irthing	NY 5660 5770	NY 5530 6332	1	2
Cairn Beck	QSL Cairn Head to Eden	NY 5550 4780	NY 4724 5708	1	2
Cumwhitton Beck	QSL Cumwhitton to Eden	NY 5170 5140	NY 4861 5200	1	2

Hall Beck	NY 521 465 to Eden	NY 5210 4650	NY 5130 4650	1	2
Hall Beck	QSL Ainstable tp Ainstable STW	NY 5390 4590	NY 5280 4645	1	2
Croglin Water	QSL Black Fell to Eden	NY 6480 4450	NY 5351 4211	1	2
Briggle Beck	QSL Lincowell to Croglin Water	NY 5890 4420	NY 5490 4494	1	2
Raven Beck	QSL Long Tongue to Eden	NY 6290 4480	NY 5511 4095	1	2
Loo Gill	QSL Haresceugh Fell to Raven Beck	NY 6380 4270	NY 6128 4349	1	2
Gamblesby Beck	QSL Black Tongue to Hazelrigg Beck	NY 6280 3920	NY 5966 3985	1	2
Robberby Water	QSL Ardale Head to Eden	NY 6700 3570	5611 3590	1	2
Hole Sike	QSL Skelling to Briggle Beck	NY 6270 3340	NY 5836 3411	1	2
Blencarn Beck	QSl at Blecncarn to Briggle Beck	NY 6365 3140	NY 6135 3240	1	2
Sclae Beck	QSL Gaythorn Hall to Hoff Beck	NY 6485 1330	NY 6814 1535	1	2
Helm Beck	QSL Water Houses to Eden	NY 7130 1090	NY 7132 1690	1	2
Blind Beck	NY 7257 1050 to Eden	NY 7257 1050	NY 7580 1350	1	2
Blind Beck	QSL Crosby Garrett to NY 7257 1050	NY 7290 0970	NY 7257 1050	1	2
Swindale Beck	QSL Swindale Head to Eden	NY 8180 1860	NY 7702 1322	1	2
Belah	QSL at Wrenside to Eden	NY 8480 0950	NY 7701 1241	1	2
Sark	QSL at Scottish Border to FWL (B721)	NY 3310 7370	NY 3270 6700	1	2

Longcleughside Beck	QSL Waingatehead to Lyne	NY 4570 6880	NY 4317 6750	1	2
Rae Burn	QSL Lads Lodge to Lyne	NY 4730 7800	NY 4649 7029	1	2
The Flosh (Kirk Burn)	QSL Low Park to Lyne	NY 5370 7020	NY 4830 7114	1	2
Dry Beck (Hall Burn)	QSL Drybeck to Esk (Border)	NY 4320 7030	NY 3695 6684	1	2
Hobbies (Hall) Burn	QSL Arthuret to Dry Beck	NY 4300 7140	NY 4124 6923	1	2
Blackrack Beck	QSL at Pears Gill to Petteril	NY 4980 4020	NY 4680 4250	1	2
Calthwaite Beck	QSL Calthwaite STW to Petteril	NY 4680 4020	NY 4740 4070	1	2
Stony Beck	QSL Greengill Foot toPetteril	NY 5130 3320	NY 4980 3490	1	2
Lamb Beck	QSL Old Wythes Wood to Petteril	NY 4120 3390	NY 4570 3290	1	2

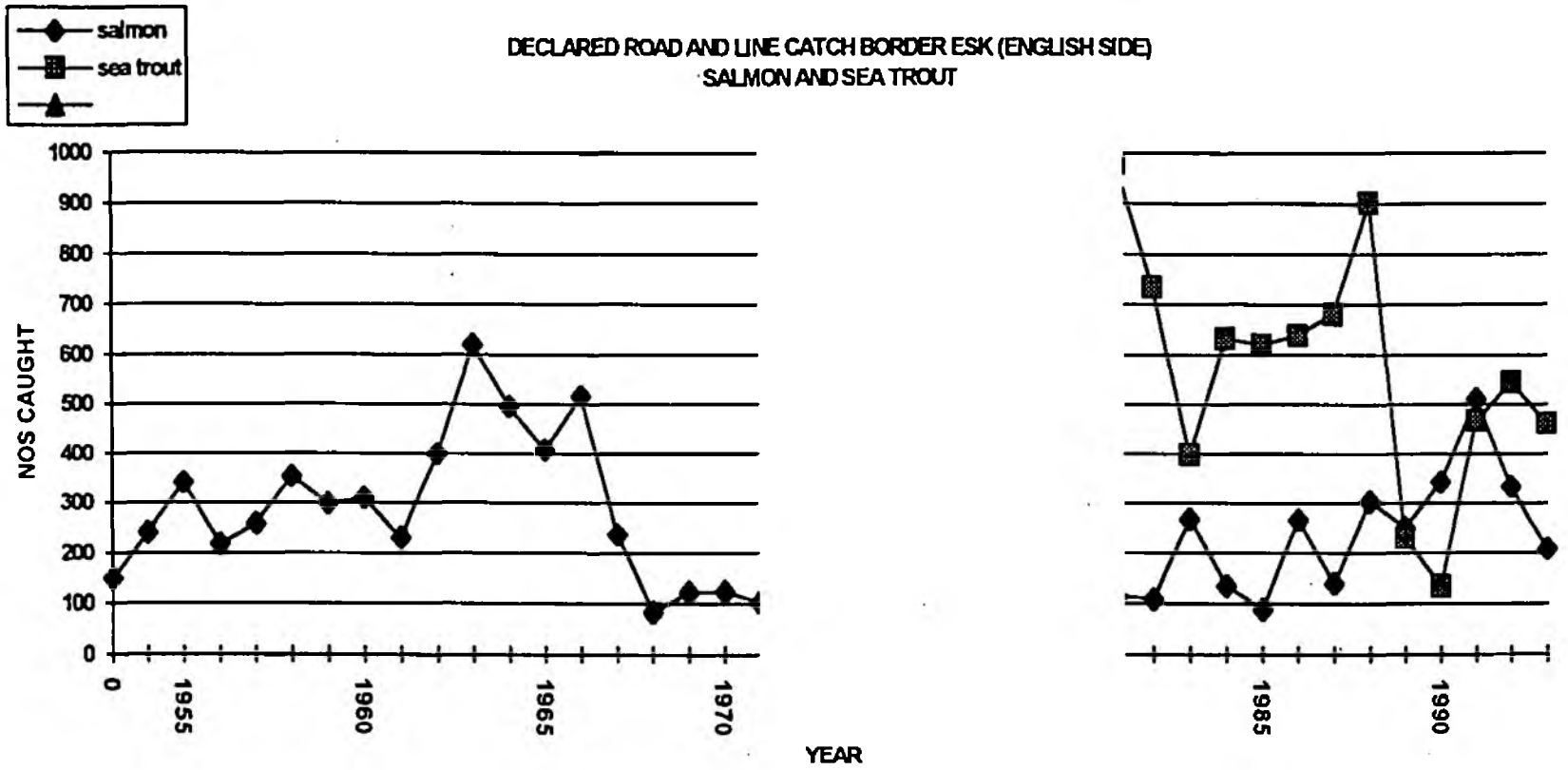
APPENDIX 5 EDEN MANAGEMENT CATCHMENT PLAN

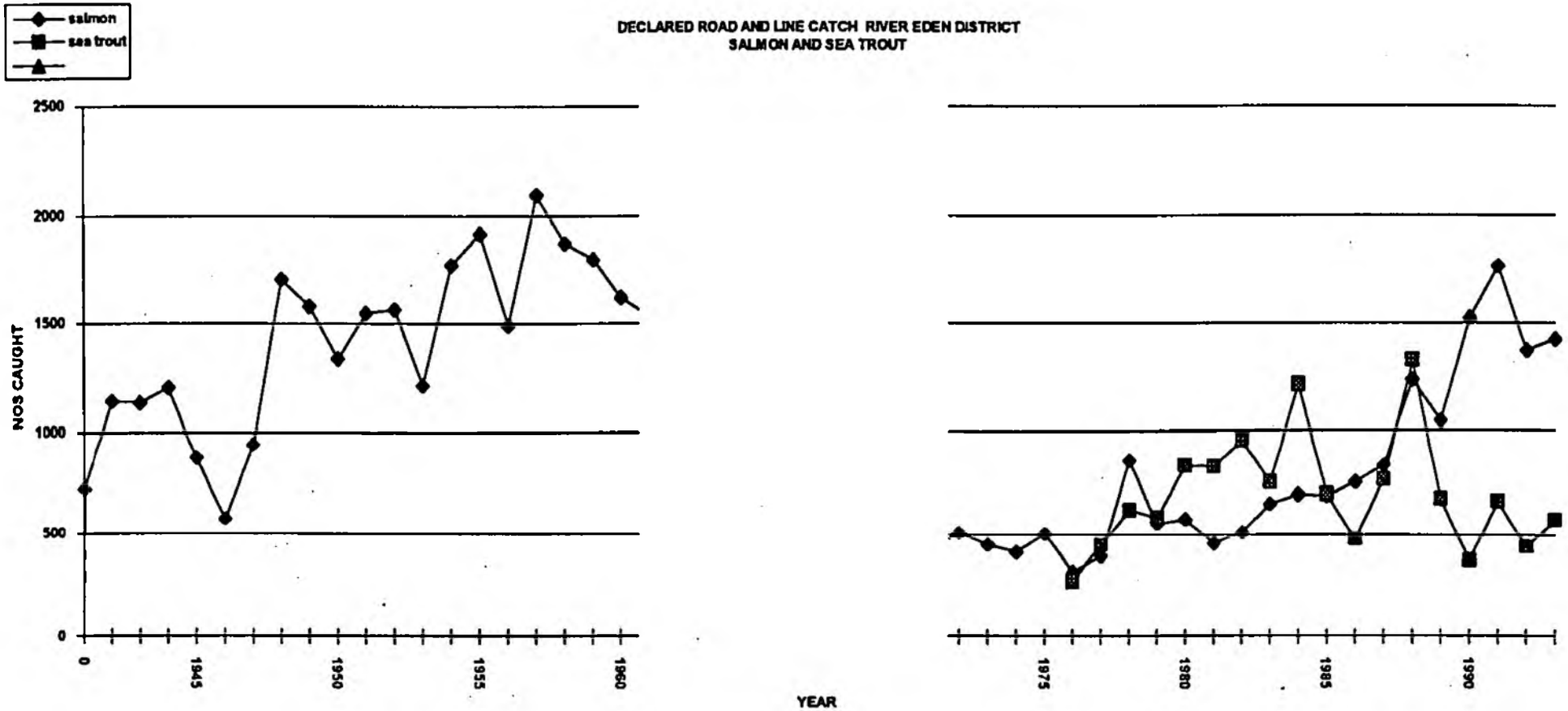
The following stretches have been given revised Water Quality Objectives which give a more accurate reflection of their water quality due to natural geographic conditions.

River Name	*Stretch Name*	*Upstream NGR*	*Downstream NGR*	*Water Quality Objectives*	
				1979 Target	*1995 Target*
Causewayh (Wath) Beck	QSL Wolsty to FWL	NY 1030 5050	NY 1400 5510	2	4
Blea Gutter	QSL Abbey Cowper to Caysewayhead Beck	NY 1530 5050	NY 1331 5339	2	4
Wampool	Whinnow Beck to FWL (Rd. Br. to The Laythes).	NY 2900 5035	NY 2430 5570	2	4
Wampool	QSL Priests Brow to Whinnow Beck	NY 3210 4150	NY 2900 5035	1	2
Cuddyarch Sough	QSL Colmire Tarn to Wampool	NY 2320 5085	NY 2470 5330	2	4
Bampton Beck	Little Bampton STW to Wampool	NY 2700 5480	NY 2502 5309	2	4
Bampton Beck	QSL Park House to Little Bampton STW	NY 2930 5470	NY 2700 5480	2	4
Wiza Beck	QSL at Silver Beck to Wampool	NY 2870 4510	NY 2740 5040	2	4
Pow Beck	Pow Beck Bridge to Caldew	NY 4200 4680	NY 6789 5096	2	4
Woodside Beck	QSL Burthwaite to Petteril	NY 4160 4940	NY 4370 5100	1	3
Brampton Beck	Brampton STW to Irthing	NY 5085 6095	NY 5040 6110	4	3
Well Sike	QSL Newtown of Rockcliffe to Lyne	NY 3900 6270	NY 3698 6485	2	4
Hether Burn	QSL Leaps Flosh to Lyne	NY 5035 6830	NY4138 6619	1	3
Longcleughside Beck	QSL Waingatehead to Lyne	NY 4570 6880	NY 4317 6750	1	3

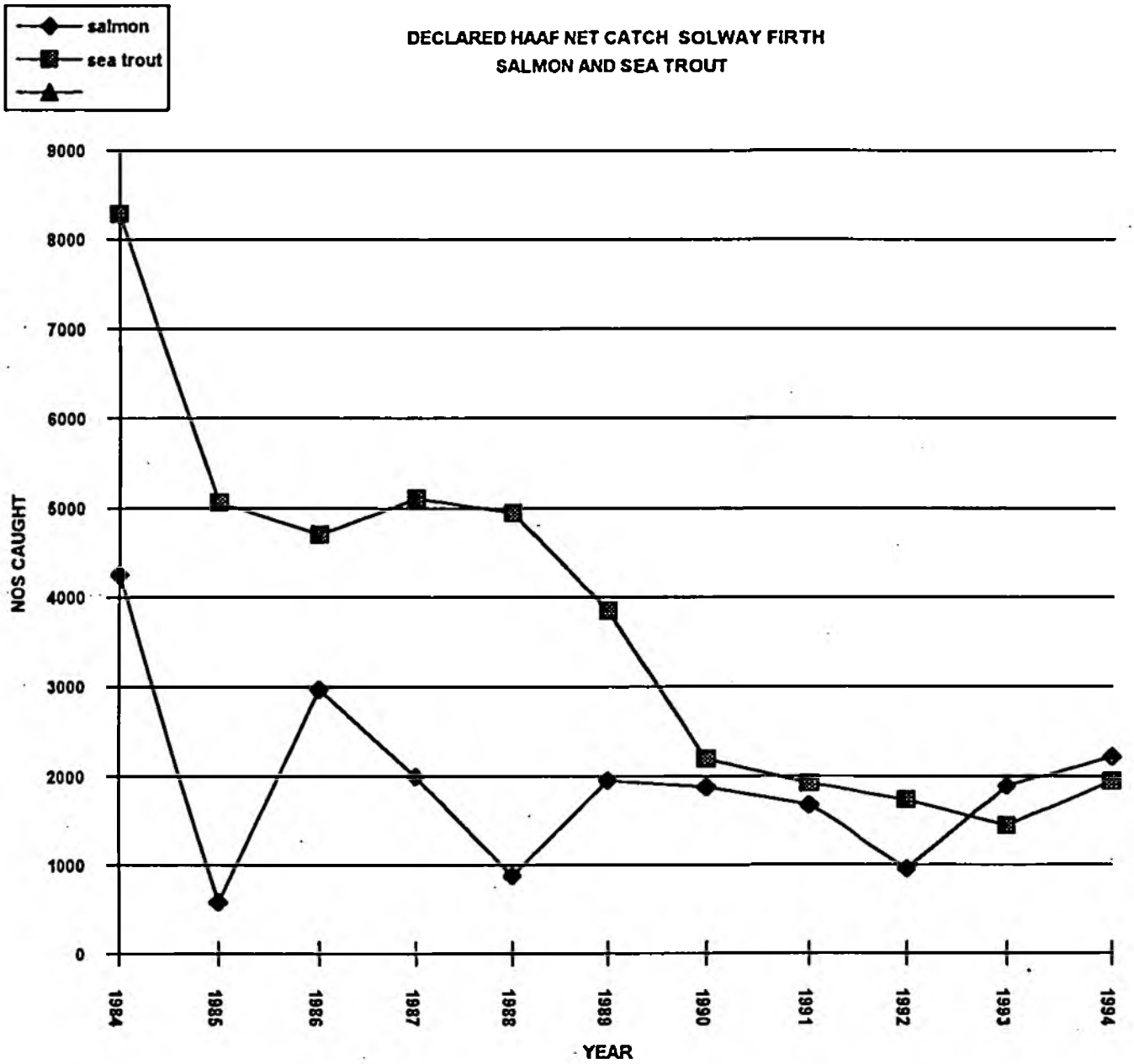
NB - 1979 Objectives = "Neutral Translation" of NWC objectives.

APPENDIX 6 - DECLARED ROD AND LINE CATCH, BORDER ESK (ENGLISH SIDE) AND EDEN SALMON AND TROUT




salmon
sea trout
DECLARED ROAD AND LINE CATCH RIVER EDEN DISTRICT
SALMON AND SEA TROUT
NOS CAUGHT
2500
2000
1500
1000
500
0
0
1945
1950
1955
1960
1975
1980
1985
1990
YEAR

APPENDIX 7 - DECLARED HAAF NET CATCH, SOLWAY FIRTH, SALMON AND SEA TROUT



APPENDIX 8 TYPICAL LAND USE RELATING TO THE VARIOUS BANDS

Land Use Band	Description of Typical Land Use
A	A reach containing the urban elements of residential and non-residential property distributed over a significant proportion of its length, or densely populated areas over some of its length. Any agricultural influence is likely to be over-ridden by urban interests. Amenity uses such as parks and sports fields may be prominent in view of the flood plain's proximity to areas of population density. Band A = 50 or more house equivalents/km.
B	Reaches containing residential and/or non-residential property either distributed over the full length of the reach or concentrated in parts but characterised by lower densities than Band A. Band B = 25 to 49.99 house equivalents/km.
C	Limited numbers of isolated rural communities or urban fringe at risk from flooding, including both residential and commercial interests. Band C = 5 to 24.99 house equivalents/km.
D	Isolated, but limited number of residential and commercial properties at risk from flooding. Agricultural use will probably be the main customer interest with arable farming being a feature. In undeveloped pockets of largely urban use, amenity interests may be prominent. Band D = 1.25 to 4.99 house equivalents/km.
E	There are likely to be very few properties and major roads at risk from flooding in these reaches. Agricultural use will be the main customer interest with either extensive grassland or, where the flood plain extent is small, arable cropping being the most common land uses. Amenity interests are likely to be limited to public footpaths along or across the river. Band E = 0.01 to 1.24 house equivalents/km.

RESPONSE TO EDEN CATCHMENT PLAN CONSULTATION REPORT

RESPONDENT:- **NAME:**

ADDRESS:

ORGANISATION REPRESENTING:

COMMENTS ON

1 THE VISION

2. THE ISSUES

Issues No. in Plan and page number	Comment

Issues No. in Plan and page number	Comment

3. **Are there Additional issues on the catchments rivers, lakes or coast which we have not identified? If so please outline the nature of the issue and any ideas you may have for resolving them on a separate sheet of paper.**

4. **General Comments on the plan and/or planning process (continue on a separate sheet if necessary.**

NRA

National Rivers Authority
North West Region

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