

RIVER IRWELL
CATCHMENT MANAGEMENT PLAN
CONSULTATION REPORT
CHAPTER TWO - UPPER IRWELL SUB-CATCHMENT



NRA

*National Rivers Authority
North West Region
September 1994*

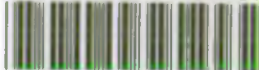
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IRWELL CATCHMENT MANAGEMENT PLAN CONSULTATION REPORT

CHAPTER TWO - UPPER IRWELL SUB-CATCHMENT

Front Cover photograph : Upper Irwell, Canoe and Fish Passes and Weir at Ramsbottom

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UPPER IRWELL CONSULTATION REPORT

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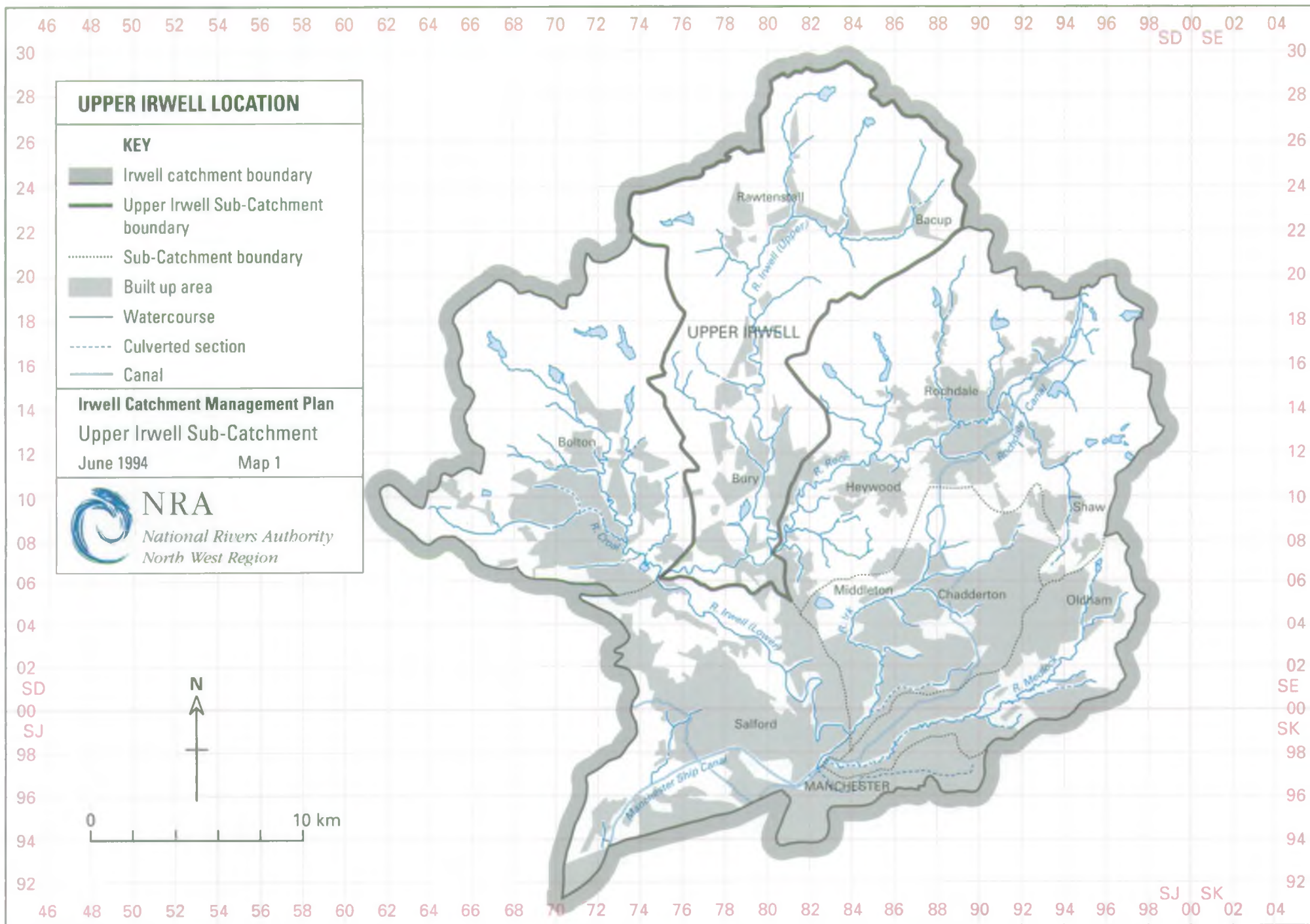
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UPPER IRWELL SUB-CATCHMENT DETAILS (MAP 1)

Area 186 km²

Population 175,000

MAIN TOWNS AND POPULATIONS

Bury	63,390
Radcliffe	32,032
Ramsbottom	12,228
Tottington	12,141
Rawtenstall	10,500

ADMINISTRATIVE DETAILS

District Councils:-

Bury Metropolitan Borough Council
Rossendale Borough Council
Blackburn District Council (Part)
Bolton Metropolitan Borough Council (Part)

NRA:- North West Region - South Area

Water Companies:- North West Water Ltd

Principal Sewage Treatment Works:- Bury
Rossendale

TOPOGRAPHY

Ground Levels	Min. Level	50 mAOD
	Max. Level	475 mAOD

GEOLOGY

Solid Geology:- Predominantly Carboniferous Coal Measures and Millstone Grit Series

Superficial Geology:- Variable - Glacial Till (Boulder Clay) Sand and Peat.

WATER RESOURCES**Availability:-**

Groundwater - Generally site specific
 Surface Water - Good availability

FLOOD PROTECTION

Length of Designated Main River:- 91.91 km.
 (maintained by NRA)

Riparian owned debris screens cleaned
 by the NRA on a best endeavours basis 4

WATER QUALITY**Length of River in National Water Council Class****1993 Assessment**

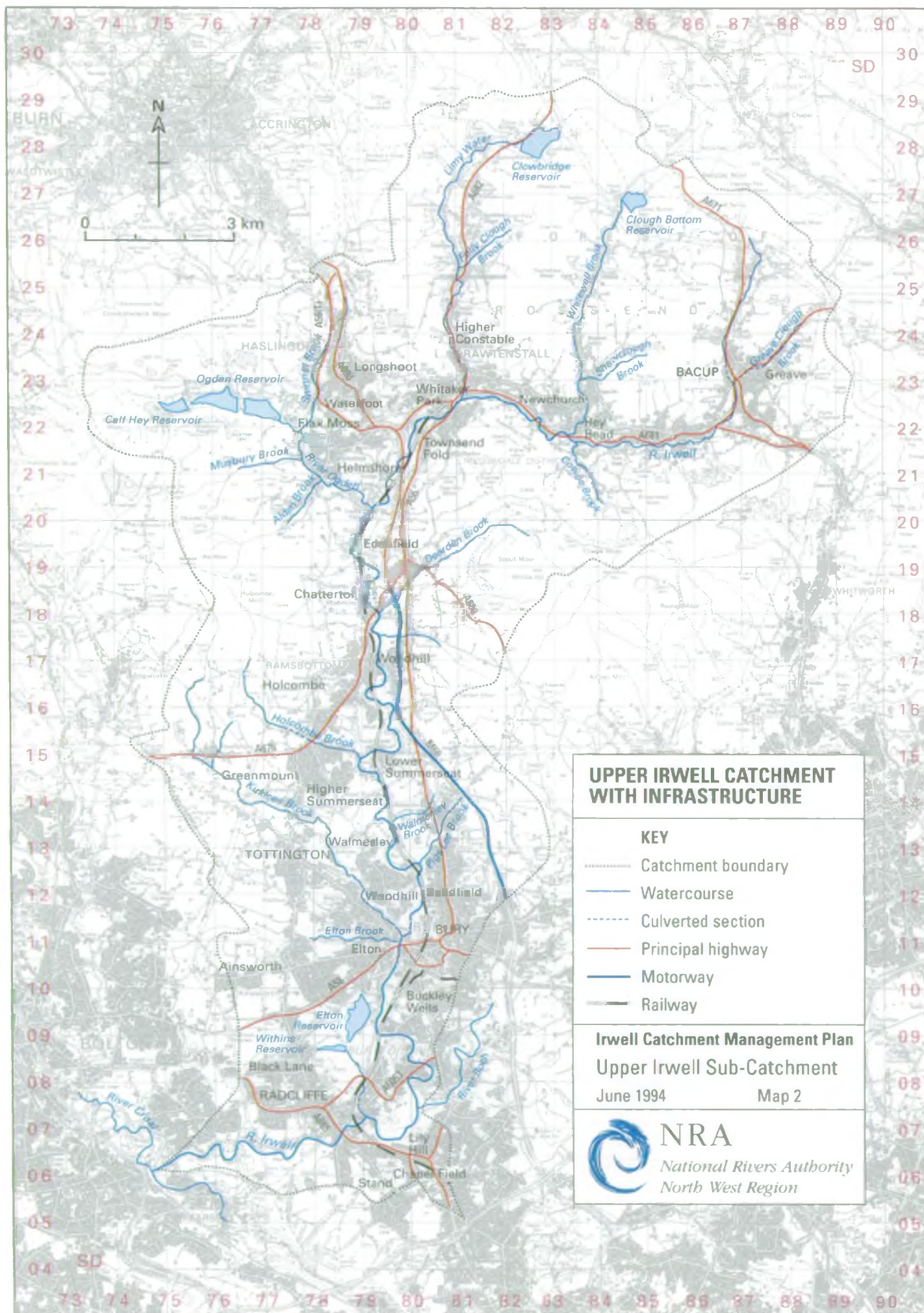
Class 1A (Very Good)	0.0 km.	Class 3 (Poor)	43.0 km.
Class 1B (Good)	10.2 km.	Class 4 (Bad)	0.0 km.
Class 2 (Fair)	22.7 km.		

FISHERIES

Length of salmonid fishery:- 45 km.
 cyprinid fishery:- variable

CONSERVATION

Number of Sites of Special Scientific Interest (SSSI) in the catchment	4
Number of SSSI's which are associated with the River Corridor and/or wetland habitats	4
Number of Site of Biological Importance (SBI) in the catchment	59
Number of SBI's which are associated with River Corridor and/or wetland habitats	50



UPPER IRWELL CATCHMENT WITH INFRASTRUCTURE

KEY

- Catchment boundary
- Watercourse
- - - - - Culverted section
- Principal highway
- Motorway
- Railway

Irwell Catchment Management Plan

Upper Irwell Sub-Catchment

June 1994

Map 2



NRA

National Rivers Authority
North West Region

1. INTRODUCTION

1.1 CATCHMENT DESCRIPTION (MAP 2)

The Upper Irwell varies considerably in character from the traditional upland scenery so reminiscent of industrial Lancashire in the north to the urbanised mainly residential areas in the South around Bury and Radcliffe. Other towns and villages within the catchment include, Tottington, Ramsbottom, Edenfield, Haslingden, Rawtenstall and Bacup. The population of the catchment is approximately 175,000.

Local Economy

The urban fringe nature of the catchment has resulted in sheep farming being the predominant use of the rural areas especially in the north. The decline of the traditional manufacturing base of textiles and footwear in the north together with paper and engineering in the South has meant diversification in the industrial base resulting in the development of modern industrial estates especially in the South. The Catchments economy is now much more closely aligned with the national picture with the growth 6 in service sector jobs. The tourism and leisure sector is of increasing importance with Ski Rossendale and the East Lancashire Railway providing major regional attractions.

1.2 HYDROLOGY

The Upper Irwell is that part of the Irwell system from its head waters to the confluence with the River Croal. The headwaters of the Irwell rise in the Central Southern Pennines and initially flow in a southerly direction before turning west near Bacup and then returning to a southerly direction near Rawtenstall. The River Irwell rises on Deerplay Moor at Irwell Spring at about 400m AOD but altitudes of up to 475m. AOD are achieved in other parts of the catchment. The principal tributaries of the Upper Irwell are Whitewell Brook and Limy Water which join from the north and the River Ogden and Kirllees Brook which enter from the north west. The total catchment area of the Upper Irwell system is 186 sq. km. (excluding the River Roch Catchment). The other Sub-Catchments in sq. kms are:-

Whitewell Brook	16.8
Limy Water	21.7
River Ogden	24.9
Kirllees Brook	14.2

The headwaters of the Irwell and its tributaries are extensively reservoirised for water supply purposes and serve the Rossendale area and also the larger towns to the south of the catchment.

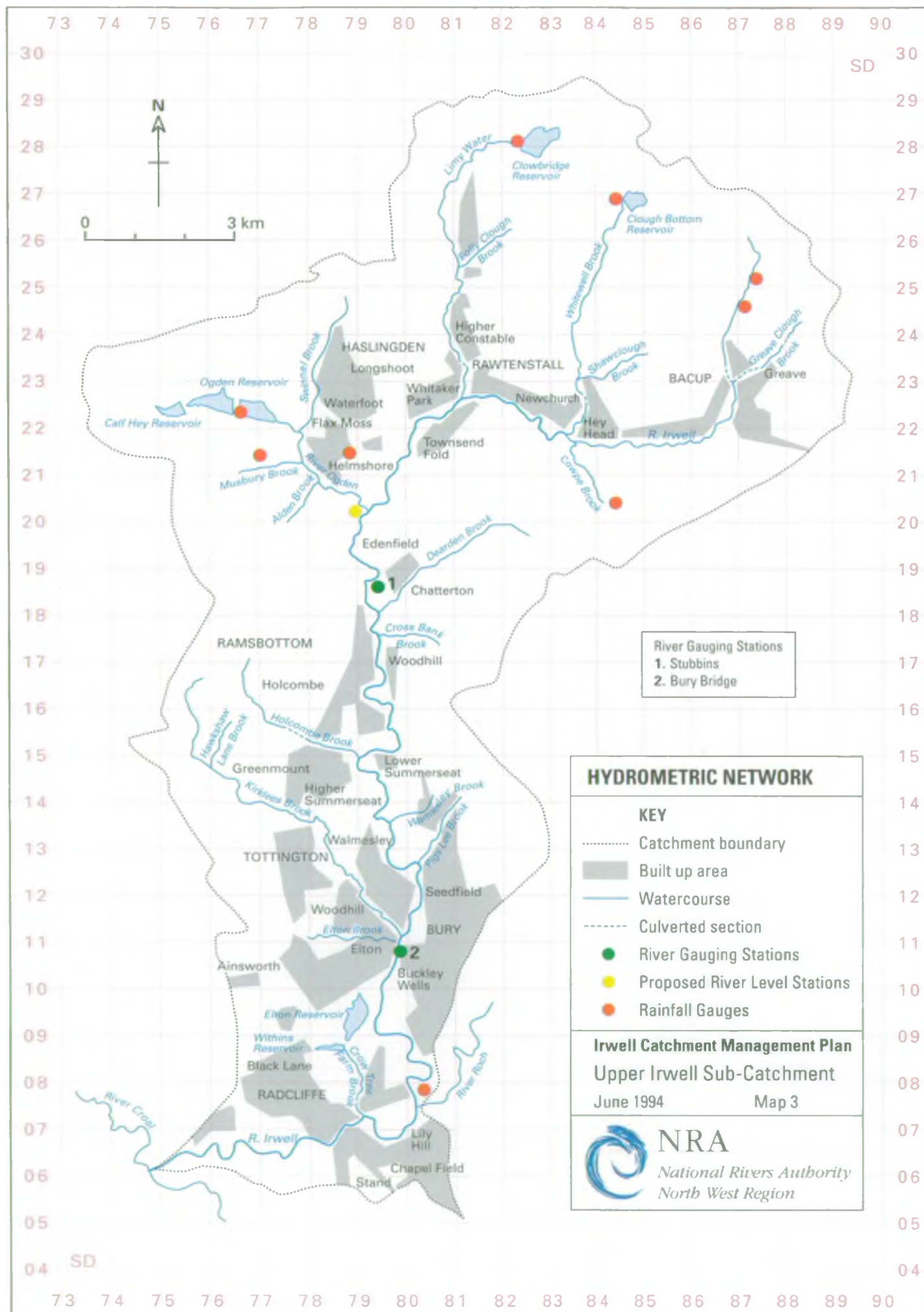
The uplands are chiefly used for grazing and hill farming with small mill towns such as Bacup, Ramsbottom, Haslingden and Rawtenstall nestling in the valley bottoms. These towns still make much use of the catchments water resources for local industries. Further downstream the valley becomes more highly urbanised and includes parts of Bury and Radcliffe with their highly diversified industrial, commercial and residential areas.

The actual rainfall recorded for the River Irwell Catchment in recent years is:

YEAR	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
RAINFALL (mm)	1361	1331	1556	1340	1511	1272	1393	1267	1544	1425

Rainfall values vary from just over 1550mm in the highest uplands to about 960mm at the River Croal confluence. The potential evaporation rates vary from about 380mm in the highest parts to about 525mm at the Croal confluence.

The long term average calculated by the Met. Office from this Authority's own records from 1961 to 1990 is 1436 mm at Cowpe Reservoir.



1.3 HYDROMETRIC NETWORK (MAP 3)

Hydrometry is defined as the measurement of water. Hydrometric information is used within the NRA by the Licensing, Groundwater and Hydrology Functions to enable them to meet their statutory duties relating to the Management of Water Resources and is also used in flood forecasting and in the design of flood defences. Additionally, hydrometric information is used to set water quality standards for both rivers and groundwater and to protect and help improve fisheries.

In the Upper Irwell Catchment there are nine raingauges. Of these nine, two are loggers (data bases which records rainfall at 15 minute intervals or the amount and duration of rainfall). This enables rainfall intensities to be studied. The loggers are downloaded monthly and maintained during these visits, and every six months they are brought into the workshop for a calibration check. The remaining seven gauges are visited for maintenance purposes every twelve months.

There are two river level monitoring stations in the Upper Irwell Catchment. Both monitor levels in a satisfactory manner and are used as part of the NRA's Flood Warning Service. However the level to flow (stage-discharge) relationship is poor. At the upper station, Stubbins, a mobile bed causes the main problem. Also the station itself is affected by roots from a nearby tree causing large cracks in the floor. At present therefore, the Hydrometric function is unable to supply quality low flow data to our customers from this station. A solution is being considered which will involve moving the station two miles upstream, close to a terminated station, but installing a bed control to facilitate low flow monitoring.

The second level monitoring station at Bury Bridge also gives problems in estimating low flows, not from a mobile bed but from small islands that force artificial levels. A site one mile upstream, complete with a reasonable industrial weir, has been investigated and plans are in hand to move to this site.

The 95 percentile flow at Bury Bridge is 0.107 cumecs. The Minimum and Maximum Daily Mean Flows are 0.10 and 205.2 cumecs respectively with a medium flow at 2.67 cumecs at the same site. These figures, however, are not reliable.

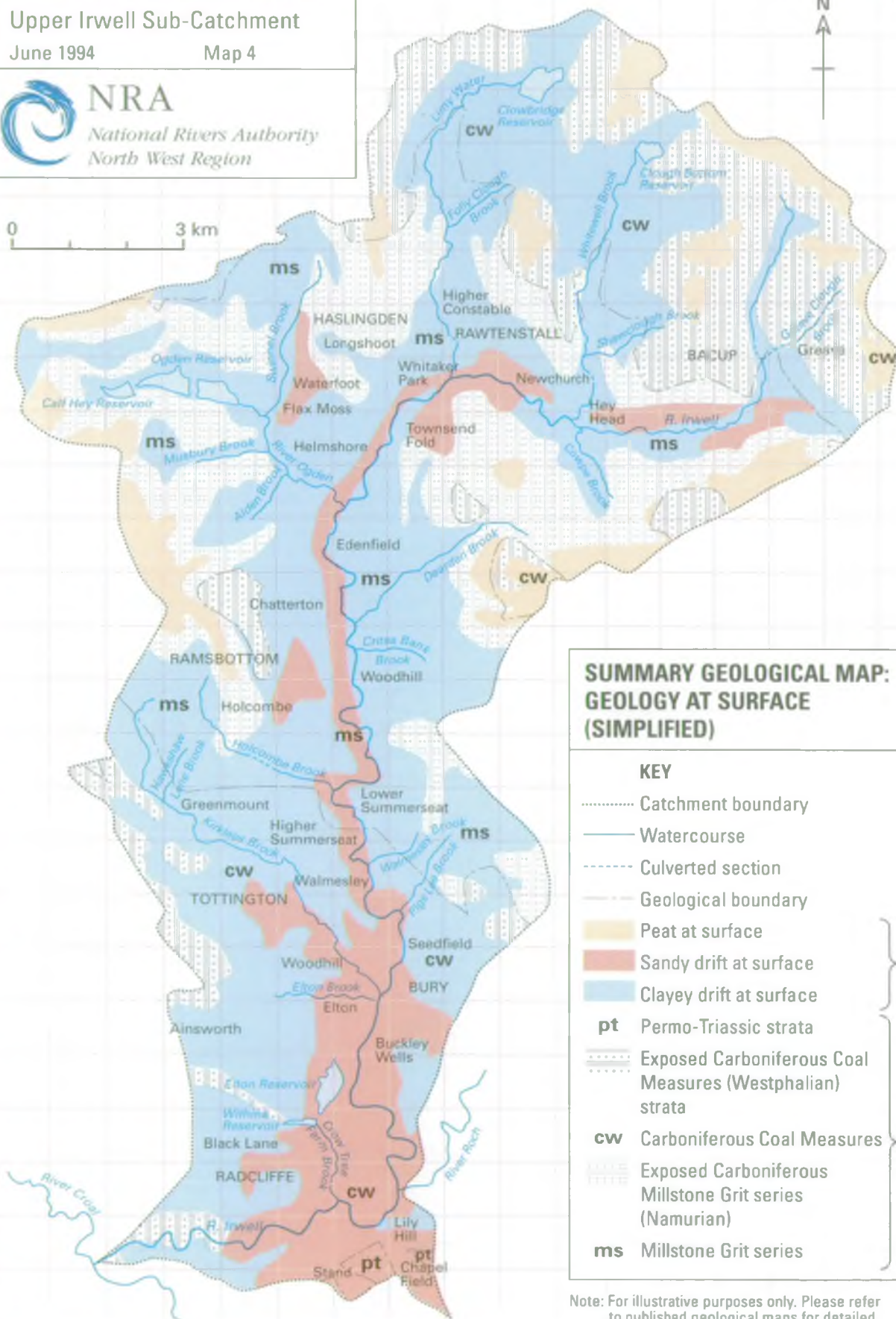
The Hydrometric function is also assisting a flood study project on Whitewell Brook by installing two temporary monitoring loggers just downstream of Ashworth Road Bridge. These loggers were installed in February 1994 and will remain on site for two years.

Irwell Catchment Management Plan
Upper Irwell Sub-Catchment
 June 1994 Map 4



NRA
 National Rivers Authority
 North West Region

0 3 km



**SUMMARY GEOLOGICAL MAP:
 GEOLOGY AT SURFACE
 (SIMPLIFIED)**

KEY

- Catchment boundary
- Watercourse
- - - Culverted section
- - - Geological boundary
- Peat at surface
- Sandy drift at surface
- Clayey drift at surface
- pt** Permo-Triassic strata
- Exposed Carboniferous Coal Measures (Westphalian) strata
- cw** Carboniferous Coal Measures
- Exposed Carboniferous Millstone Grit series (Namurian)
- ms** Millstone Grit series

DRIFT

SOLID

Note: For illustrative purposes only. Please refer to published geological maps for detailed distribution of 'solid' and 'drift'

1.4 HYDROGEOLOGY (MAP 4)

With the exception of a very small area of Permo-Triassic sandstone and marl in the extreme south east, the entire catchment is underlain by strata of Carboniferous age. Millstone Grit Series (Namurian) rocks dominate the centre of the basin whilst younger Coal Measures (Westphalian) strata are present to the north and south. These both comprise alternating sequence of shales/mudstones, siltstones and sandstones. They tend to be only gently folded but have been affected by faulting. Thicker coarse grained sandstones occur in the Namurian, whilst shales/mudstones predominate in the Westphalian succession. The latter also contains a number of coal seams.

The Carboniferous sandstones tend to act as individual "minor" aquifer units separated by lower permeability shales/mudstones. Groundwater movement is generally by fissure flow. The presence of old coal workings in the Coal Measures can give rise to complex and rapid groundwater flow and can adversely affect groundwater quality.

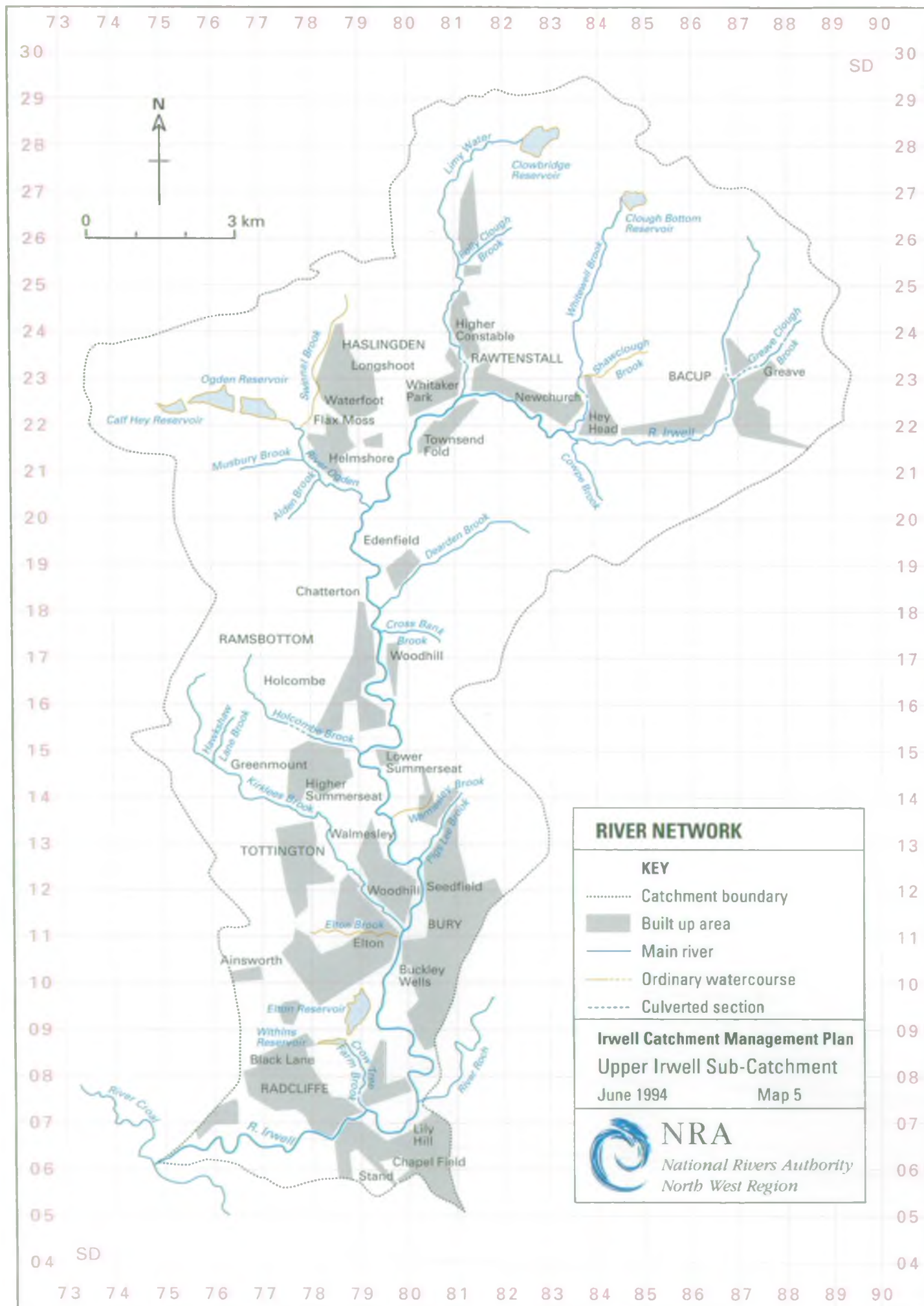
The Permo-Triassic sandstone forms the northern tip of an extensive major aquifer which extends and thickens southwards below Manchester, down to Stockport and west through to Liverpool.

Much of the area is covered by drift deposits, principally glacial till (boulder clay). However, this tends to be absent on the higher ground to the north. Permeable sands and gravels occur within the drift, mainly associated with the flood plain of the River Irwell. These may act as minor aquifers in their own right.

Depending on the nature and thickness of the drift deposits, the underlying solid aquifers may be in hydraulic continuity with surface watercourses.

The minor aquifers formed by the sandstone units of the Carboniferous series have been exploited to provide private domestic and agricultural water supplies, particularly in rural areas remote from the mains system. The sandstones may also give rise to springs/discharges to surface waters. The availability of groundwater from these minor aquifers is very site specific, depending on the local hydrogeology and topography.





1.5 FLOOD DEFENCE (MAP 5)

Flood Defence is generally concerned with ensuring that flood flows in rivers are conveyed with the least possible impact on people and property. This involves the NRA in maintenance of watercourses, construction of new works, development control and flood warning.

Regular maintenance is carried out where necessary in the Upper Irwell Catchment, and includes such items as clearing debris from debris screens, culverts and bridges, and generally ensuring the maximum flood carrying capacity of the watercourses.

New flood defence schemes are carried out under an agreed programme which covers a ten year period. They must be worthwhile and shown to be value for money, before government and flood defence committee approval is given, and are subject to rigorous financial controls. Generally schemes are carried out to alleviate flooding from watercourses, but may also assist in maintenance activities. Examples of these are:-

- Construction of embankments, retaining walls and flood storage basins - to protect against flooding.
- Silt traps, debris screens and access ramps - to assist with maintenance activities.

Development Control is carried out in the Upper Irwell catchment to ensure that new development is discouraged in areas at risk from flooding, and is not allowed to increase the risk elsewhere. Any works carried out on watercourses by others are also subject to control by the NRA.

The NRA operates a Regional Flood Warning service which aims to give the public advanced warning of likely flooding so that appropriate precautions can be taken. When necessary, emergency staff are also deployed by the NRA, to clear blockages to debris screens, culverts and channels, and provide temporary flood defences using sand bags.

1.6 WATER QUALITY

The Upper Irwell and its major tributaries are classified with regard to water quality. A comprehensive monitoring programme indicates that significant lengths of the catchment are polluted and of poor aesthetic appearance.

Monitoring is also undertaken with regard to the requirements of certain EC Directives and to discharges to the catchment.

The main sources of pollution in the catchment are discharges from the major sewage treatment works at Rossendale and Bury and the sewerage networks feeding them. These discharges are the responsibility of North West Water Limited. Significant expenditure will be required for improvements.

Trade effluent discharges, run-off from industrial sites and ochreous land drainage (mainly from past mine workings) generally have a more localised impact. Difficulties in reducing the impact of ochreous discharges can arise in establishing liability and securing the likely substantial funding.

The River Roch Sub-Catchment also has a significant influence on the lower part of the catchment.

Many storm water drains are contaminated causing widespread localised pollution because domestic foul water is connected to the storm water drainage system rather than the foul water system. Investigation and resolution of such wrong connections can be difficult.

2. CATCHMENT USES AND ACTIVITIES

2.1 FLOOD DEFENCE

2.1.1 General

This use deals with the provision of effective flood defence for people and property against flooding from rivers and watercourses. Normally flooding is a result of extreme climatic conditions, such as very heavy or prolonged rainfall. Flood events are described in terms of the frequency at which, on average, a certain severity of flood is exceeded. This frequency is usually expressed as a return period in years, e.g. 1 in 50 years.

The effectiveness of flood defences can be measured in terms of the return period up to which they prevent flooding. The target standard for flood defences should be dictated by the type of land use. For instance, urban areas will require more effective defences than say pasture land.

The NRA's duties and powers relating to Flood Defence are detailed in Section 3.1 of Chapter One River Irwell Introduction document

2.1.2 Local Perspective

The Upper Irwell flows from its source on Deerplay Moor north of Bacup, through the towns of Bacup, Rawtenstall, Ramsbottom, Bury and Radcliffe to its confluence with the River Croal. It is fed along its 40 km length by ten "main river" tributaries, the major ones being Whitewell Brook, Limy Water and Kirklees Brook.

Whitewell Brook rises at Deerplay Hill and flows in a southerly direction through Clough Bottom Reservoir towards its confluence with the River Irwell at Waterfoot. As the brook flows through Newchurch it is channelled via numerous bridges and culverts some of which are restrictive.

From its "main river" limit at Clowbridge Reservoir, Limy Water flows in a southerly direction towards its confluence with the River Irwell at Rawtenstall. Upstream of, and through the town of Rawtenstall, the watercourse is channelled via numerous bridges and culverts.

From its source north of Hawkshaw Wood, Kirklees Brook flows in a southerly direction to the north of Tottington and then to its confluence with the River Irwell north west of Bury town centre. The majority of property is located on high ground due to the steep valley sides.

Regular, planned inspections of "main river" channels and structures are carried out in order to programme any necessary maintenance works. Such works are carried out in the Upper Irwell catchment to safeguard the existing standards of flood protection, particularly in the heavily urbanised areas, such as Bacup, Rawtenstall, Ramsbottom and Bury. The work includes clearing debris blockages from channels, culverts, bridges and trash screens, and also de-silting and dredging using mechanical plant.

The NRA clears numerous culvert debris screens within the Upper Irwell catchment, at a general frequency of at least once per week. Such screens prevent large items of debris becoming trapped in culverts and subsequently causing flooding and structural problems.

2.1.3 Flood Warning

The NRA provides information and advice to the Police and Local Authorities for the purpose of giving them sufficiently advanced warnings of likely flooding in known flood risk areas. Forecasts of high river levels are based on rainfall and river level data collected from outstations by the Regional Telemetry System.

2.1.4 Objectives

Flood Defence objectives are detailed in Chapter One, River Irwell Introduction document, Section 3.1.1.

2.1.5 Environmental Requirements

Environmental Requirements relating to Flood Defence are detailed in Chapter One, River Irwell Introduction document, Section 3.1.

2.2 DEVELOPMENT

2.2.1 General

The relationship between NRA activities and the land use planning system is dealt with in Section 2.3 of Chapter One, River Irwell Introduction document.

2.2.2 Local Perspective

The Catchment is within the South Area of the NRA (North West Region). Any new development may be of concern to the NRA, as proposals may have an impact on all our duties and responsibilities. It is imperative that the NRA has an effective and efficient input in the development of the catchment to ensure developments are implemented with our interests fully taken into account.

2.2.3 Local Planning Policy

The majority of the Catchment is contained within the Lancashire Borough of Rossendale and the Metropolitan Borough Council of Bury. The Structure Plan for Lancashire and Greater Manchester forms the strategic planning framework for the Catchment. The Rossendale District Local Plan, First Review has reached the stage of completing the Public Inquiry (February 1994) and the Deposit consultation stage of the Bury UDP has been completed. The adoption of this latter document will supersede the structure plan policies.

The main LPA objectives for future development in the Catchment include:

- Protecting and improving the environment.
- Securing growth and development of the local economy
- Promotion of urban regeneration.

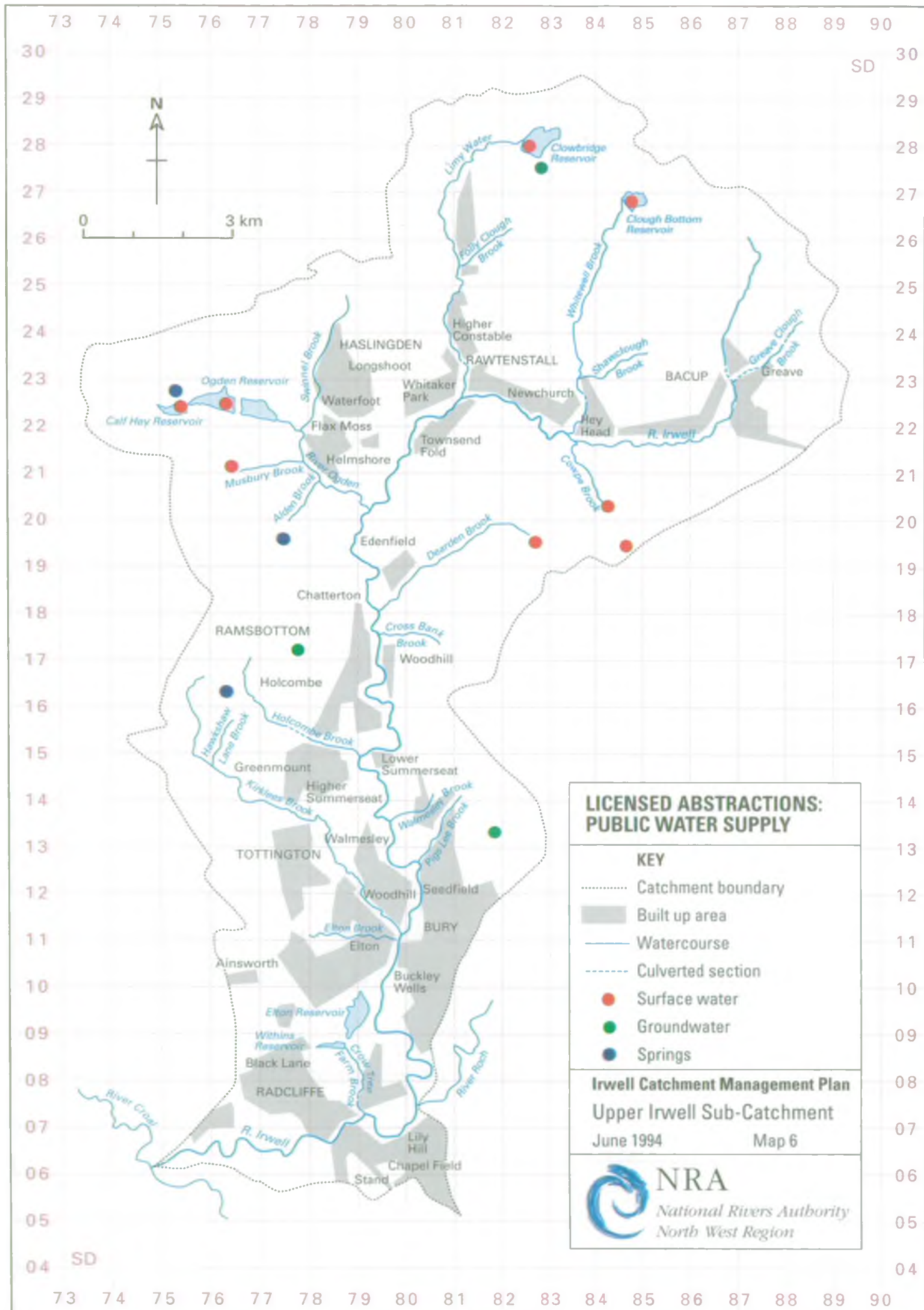
The well-established Green Belt policy boundary has strictly limited outward growth of the Catchment's main urban areas.

The watercourses of the Upper Irwell have suffered through historical industrialisation and urbanisation in the main towns during the late eighteenth and nineteenth centuries. However, the loss of traditional manufacturing firms and moves towards cleaner production methods has resulted in a healthier and more attractive water environment generally. Positive land-use planning has also played a vital part. The Croal/Irwell Valley Local Plan has been of prime importance in helping to bring about improvements, especially in the southern half of the Catchment and has generally steered development away from the River Valleys.

2.2.4 Future Development in the Catchment

The watercourses within the Catchment have been noted for their landscape, wildlife, open land and recreational importance through the preparation of the Development Plans. This will continue to be encouraged by the NRA up to adoption of the Plans and will be used as recommendations in the determination of planning applications. The CMP must support the overall economic and environmental improvements and seek to reduce adverse environmental conditions new development may cause.

The NRA through the planning system will seek to discourage development in areas at risk from flooding, achieve water quality improvements and promote the conservation of the water environment. The main targets of the NRA's policy directions to be pursued through the planning system are detailed in Section 2.7 of Chapter One, River Irwell Introduction document.



2.3 POTABLE (DRINKING) WATER SUPPLY (MAP 6)

2.3.1 General

This use relates to the abstraction for water for potable supply use. The principal abstractor is the statutory water company (NWW Limited) though there are small domestic abstractions, particularly in the upper part of the catchment, which are exempt from licensing requirements.

Groundwater may be abstracted from water bearing strata (termed aquifers) via wells or boreholes, or naturally discharge via springs.

2.3.2 Local Perspective

There are five major abstraction licences covering the reservoir systems in the Upper Irwell Catchment. - These licences cover Clough Bottom Reservoir, Scout Moor Reservoir, Cragg and Cowpe Reservoirs, Clowbridge Reservoir and the Ogden, Calf Hey and Holdenwood system.

The total authorised licensed quantity from these sources is 14,875 ML/y which is 36% of the total licensed abstraction in the catchment and 38% of the total licensed surface water.

These reservoir systems are also subject to compensation water requirements under the provisions contained in local Water Acts which were inherited in the formation of the Regional Water Authorities in 1974.

There is only one licensed source in the catchment which abstracts from coal measures for public water supply purposes. This abstraction pumps into Clowbridge reservoir to supplement the abstraction from this source and is licensed for 164.8 ML/y which is only 6% of the total licensed groundwater within the catchment.

The minor aquifers formed by the sandstone units of the Carboniferous series have been exploited to provide private domestic and agricultural water supplies, particularly in rural areas remote from the mains system. The sandstones may also give rise to springs/discharges to surface waters. The availability of groundwater from these minor aquifers is very site specific, depending on the local hydrogeology and topography.

These private supplies will be subject to water quality monitoring and the local Environmental Health Department should keep registers of all such supplies. The majority of these supplies are outside the direct control of the NRA.

2.3.3 Supply Objectives and Standards

The NRA has yet to establish formal policy with regard to supply objectives but the following will be, and in many cases are already being actively pursued:

- To manage water resources to safeguard private water supplies.
- To manage surface water resources to meet future demand.
- To set minimum residual flows (MRF's) and minimum control levels (MCL's) where applicable, to protect environmental river needs.
- To ensure compliance with existing MRF's and MCL's through monitoring and enforcement policy.
- To ensure the best utilisation of water resources in the catchment.
- To conserve, augment and/or redistribute, and to ensure the proper use of water resources, where appropriate, to meet potable water demands to appropriate standards of reliability.
- To encourage efficient water use, including leakage reduction.
- To carry out a review of compensation water requirements to ensure the best utilisation of resources for various users.
- To monitor water quality at the appropriate abstraction point to ensure compliance with EC Directive 75/440/EC.
- To maintain and where necessary improve water quality in accordance with existing river quality objectives and Statutory Water Quality Objectives (SWQO's) established.

In dealing with new applications involving groundwater abstractions, the following objectives will be pursued:

- To manage water resources to safeguard private water supplies.
- To manage groundwater resources where possible to meet future demand.
- To protect aquifers from over commitment and ensure groundwater abstraction does not have an unacceptable effect on surface waters and related environmental interests.

- To ensure the best utilisation of water resources in the catchment.
- To conserve, augment and/or redistribute, and to ensure the proper use of water resources where appropriate to meet potable water demands to appropriate standards of reliability.
- To encourage efficient water use including leakage reductions.
- To implement groundwater protection policies.

2.3.4 Customer Supply Requirements

Water Quantity:

- To expect availability of resources within the terms specified in the licence.
- To expect no derogation of supplies when issuing new licences.

Water Quality:

- To expect compliance with relevant standards set in EC Directive 75/440/EC (surface water Abstracted for Drinking water).

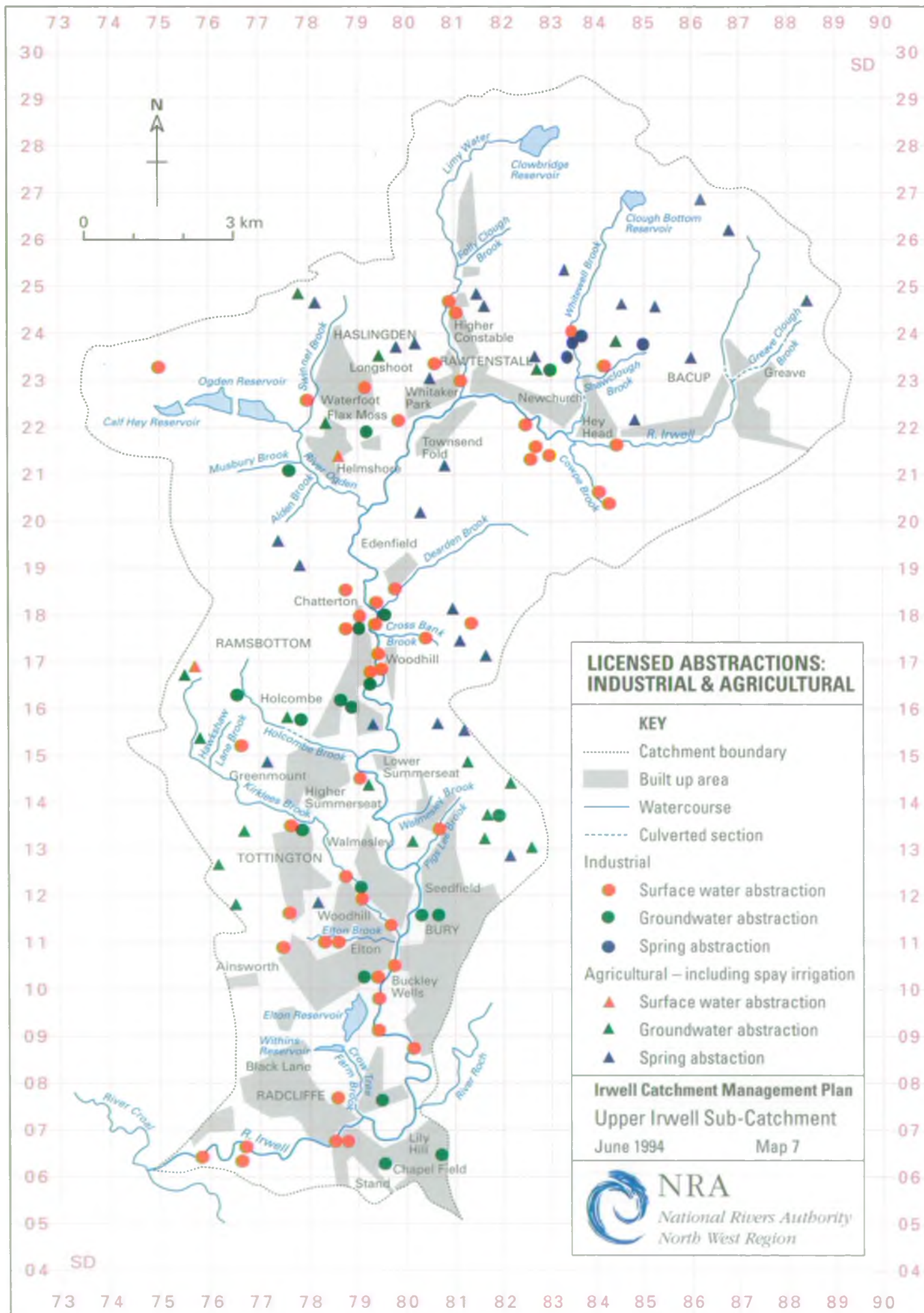
Groundwater Quality:

The major Permo-Triassic sandstone aquifer generally contains high quality groundwater. However, it will have been prone to contamination from past and present land usage, particularly in urban areas where low permeability drift cover is absent, for example in Central Manchester.

Groundwaters associated with Carboniferous Coal Measures sandstones are typically high in iron. This can also be acute in groundwaters contained in old mine workings. In addition, mine waters often have elevated levels of chloride and sulphide. Similarly, elevated levels of iron may be present in the Millstone Grit Series sandstones.

2.3.5 Environmental Requirements

Ensure flows do not fall below an ecologically acceptable level, so that there is no adverse impact on aquatic flora and fauna, natural geomorphology and adjacent habitats.



2.4 INDUSTRIAL AND AGRICULTURAL ABSTRACTIONS (MAP 7)

2.4.1 General

This use relates to the abstraction of water from ground and surface waters for industrial and agricultural use including spray irrigation. The majority of such abstractions will require an abstraction licence.

2.4.2 Local Perspective

Industrial

There are 66 licensed abstractions within the Upper Irwell Catchment for industrial purposes. The total licensed quantity from these sources is 25,518 ML/y which is 61% of the total licensed abstraction within the catchment. Of this total, 23,056 ML/y (90%) is from surface water sources and 2,462 ML/y (10%) is from groundwater sources.

Many major companies rely on the rivers and streams within the catchment to provide a water supply for their various processes of manufacture, principally paper making and textile production.

General Agriculture

There are 45 licensed abstractions for this purpose in the Upper Irwell Catchment totalling 101 ML/y which is 0.24% of the total licensed abstraction. All these abstractions are from groundwater sources in the form of boreholes, wells and springs. Although there are a large number of licences, these abstractions represent only 3.75% of the total licensed groundwater within the catchment. There are also sources, particularly in the upper reaches of the catchment which are used for general agricultural purposes and which are exempt from licensing requirements.

Spray Irrigation

There are only three licensed abstractions for spray irrigation purposes within the catchment. Two of these are for golf course irrigation and one is for agricultural spray irrigation. Of these licences, two are from surface water sources and one is from a borehole. The total licensed quantity represents only 0.03% of the total licensed quantity within the catchment.

2.4.3 Supply Objectives and Standards

The NRA has yet to establish formal policy with regard to supply objectives, but the following will be, and in many cases are already being, actively pursued:

**CATCHMENT USES AND ACTIVITIES
INDUSTRIAL AND AGRICULTURAL ABSTRACTIONS**

- To manage water resources to safeguard direct industrial abstractions.
- To manage water resources where possible to meet reasonable industrial demand.
- To set minimum residual flows (MRF's) and minimum control levels (MCL's) where applicable, to protect environmental river needs.
- To ensure compliance with existing MRF's and MCL's through monitoring and enforcement policy.
- To protect aquifers from over commitment and ensure that groundwater abstraction does not have an unacceptable effect on environmental waters.
- To ensure the best utilisation of water resources in the catchment.
- To conserve, augment and/or redistribute, and to ensure the proper use of water resources, where appropriate to meet industrial water demands to appropriate standards of service.
- To encourage efficient water use, including leakage reduction.
- To ensure compliance with licence conditions through monitoring and enforcement policy.
- To implement groundwater protection policies.

2.4.4 Customer Requirements

Water Quantity

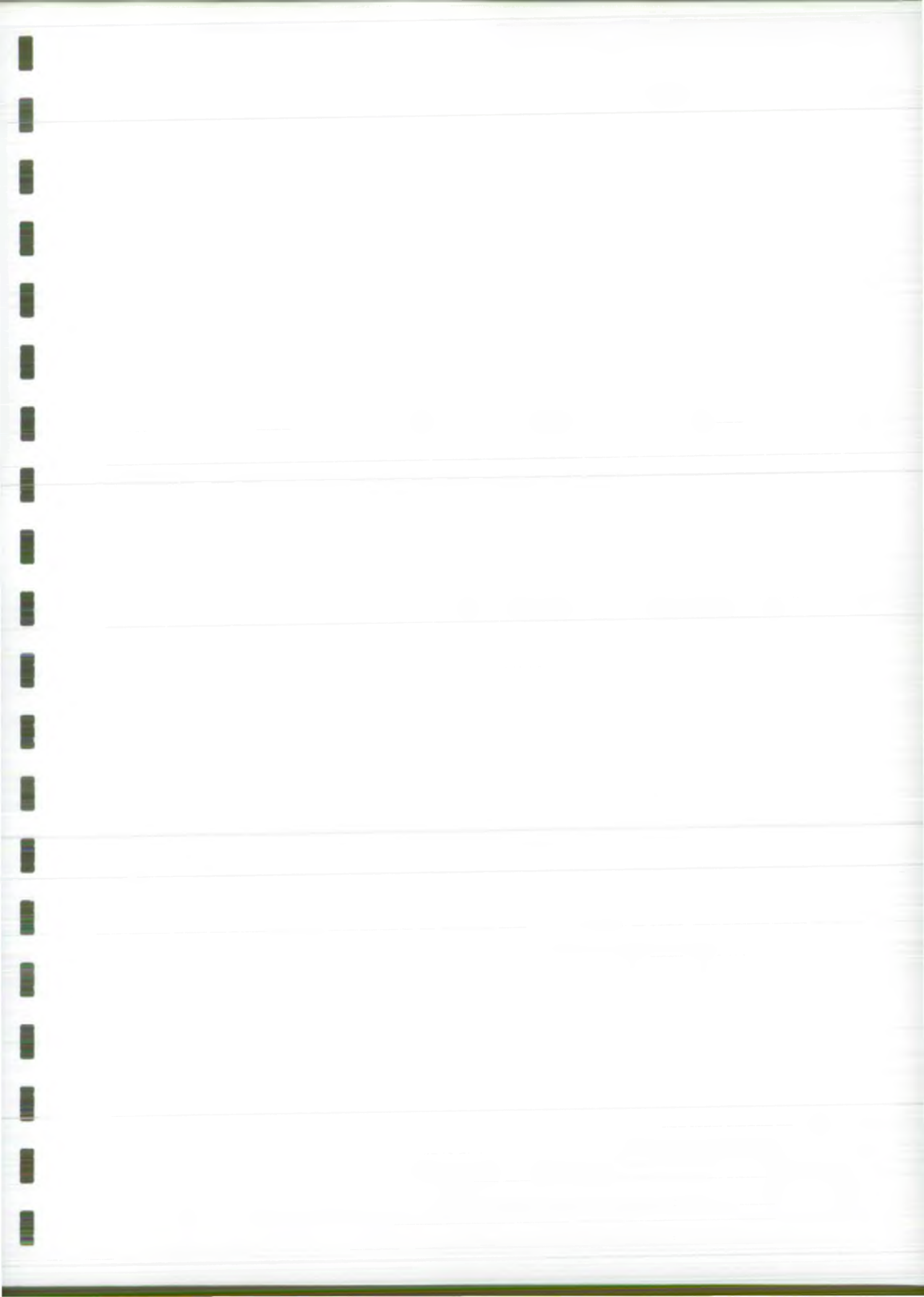
- To expect availability of resources within the terms specified in the licence.
- To expect no derogation of supplies when issuing new licences.

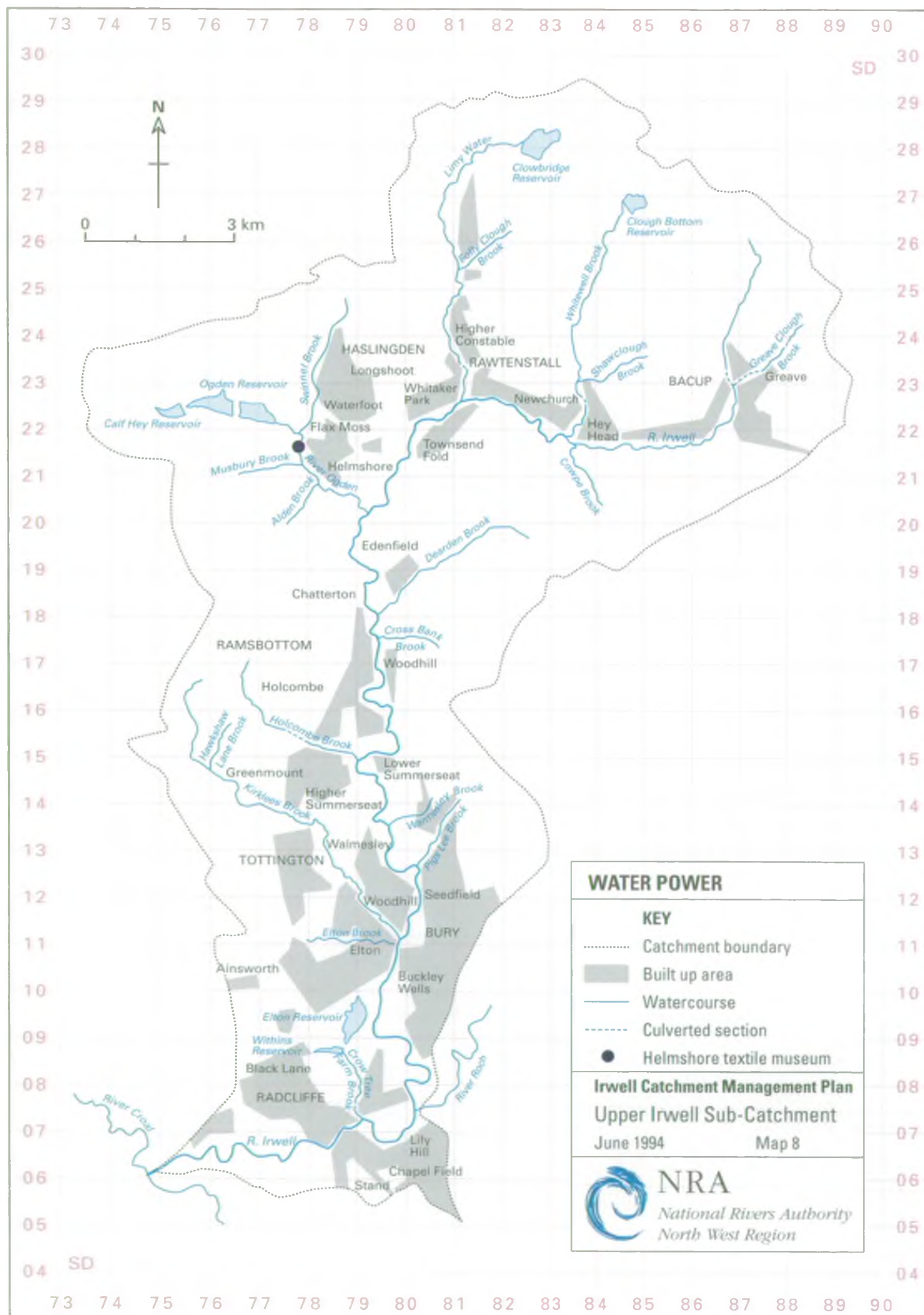
Water Quality

- To expect maintenance and improvement of water quality in accordance with relevant water quality objectives.

2.4.5 Environmental Requirements

Ensure flows do not fall below an ecologically acceptable level, so that there is no adverse impact on aquatic flora and fauna, natural geomorphology and adjacent habitats.





2.5 WATER POWER (including Mill Rights) (Map 8)

2.5.1 General

This use deals with water power as the primary motive force in energy generation and also with its appeal as a tourist attraction or its amenity value.

2.5.2 Local Perspective

At present water power is or could be used at the following site in the catchment:-

Helmshore Textile Museum, Higher Mill, Helmshore, Rossendale. Water is used to drive the restored water wheel as and when required when the mill is open to the public. Water also provides an amenity flow to the mill reservoirs.

2.5.3 Environmental Objectives

Water Quality:

- To maintain water quality to the standard necessary to permit continued use of the mills.

Water Quantity:

- To maintain sufficient quantity of water to enable the prescribed use to continue.

Physical Features:

- To maintain millstreams free of silt, obstructions and weed growth sufficient to enable continued use.

2.6 RESOURCE USAGE

2.6.1 General

This section summarises the total licensed and actual abstraction within the catchment compared with the available resource. Licensed and current actual usage have been assessed for the catchment.

The available resource is derived from the average annual rainfall for the period 1961 - 1990 less the average annual evaporation for the catchment. This provides an estimate of the total surface water resource available but is not derived from a detailed assessment of runoff, groundwater recharge or any time elements.

These totals are compared with the total annual licensed abstraction and the actual average consumptive use in 1992. The purpose of the comparison is to illustrate the scale of water resource development within the catchment.

	Available Resources in average Year Jan-Dec	Licensed or Committed Abstraction	Actual Average Abstraction 1992
Surface	407 Ml/d	173 Ml/d	52 Ml/d
Groundwater	No data	17.7 Ml/d	3.5 Ml/d

NB These figures include canal abstractions within the catchment but it should be noted that canals will import water from, and export water to other catchments.

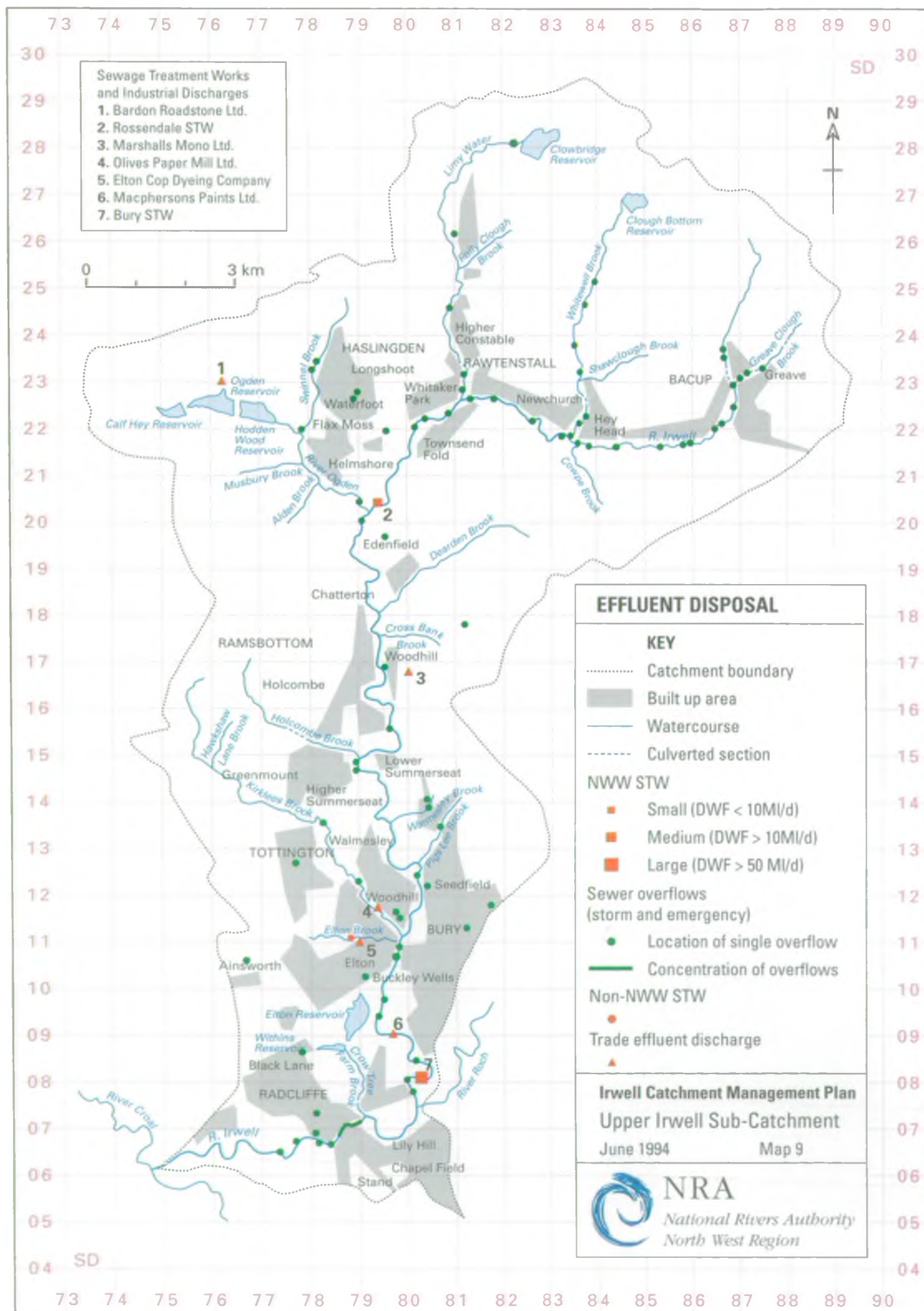
2.6.2 Local Perspective

Surface Water:

Water resources availability in the Upper Irwell Catchment is more than adequate to meet any existing demand and future development. Any problems that may arise will be on a site specific basis on the more minor tributaries.

Groundwater:

In volume terms the main licensed groundwater abstractions within the catchment are from the Coal Measures and Millstone Grit Series for industrial and commercial use. Elsewhere there may be scope for additional abstractions, but this would need to be assessed on an individual basis.



2.7 EFFLUENT DISPOSAL (MAP 9)

2.7.1 General

This use principally relates to the disposal of domestic and industrial effluents to the river system. Dependent on nature, effluents may be discharged continuously or intermittently.

Continuous Effluents

Continuous discharges are of fully treated effluent from sewage treatment works and trade effluent treatment plants.

The more significant sewage treatment works are almost exclusively operated by water companies, in this case North West Water Limited. Such sewage works may receive both domestic and industrial waste. Houses and other premises remote from the established sewerage network may use an individual sewage treatment plant with discharge to watercourse as an alternative to septic tank or cess pit as a means of disposal of foul drainage.

Industrial concerns may also opt to treat their trade waste at their own treatment facility with discharge to watercourse.

The quality of such continuous effluents is controlled by consents issued by the NRA. In the past this has been the case for all types of continuous effluents. However discharges from certain prescribed industrial processes are now authorised by HMIP under Integrated Pollution Control (IPC).

Intermittent Effluents

The most significant category of intermittent effluent is that from storm overflows on the sewerage network. Sewage effluent may also be discharged intermittently from the sewerage network in the event of emergency at pumping stations. Both these types of discharge are the responsibility of North West Water Ltd. and the circumstances in which they are permitted to occur are controlled in consents issued by the NRA.

Another category of intermittent effluent is the surface water run-off from urban areas.

2.7.2 Local Perspective

Continuous Effluents

There are two significant North West Water Ltd STWs within the Upper Irwell catchment. These are at Bury and Rossendale. Bury is the larger having a dry weather flow of 76.5 ML/d compared with the dry weather flow from Rossendale of 25.0 ML/d.

There are five industrial discharges direct to river. Two are of quarry drainage. These are from Marshalls Mono Limited, Fletcher Bank Quarry and Bardon Roadstone Jamestone Quarry. The others are various process waters (mainly backwashings) from Elton Cop Dyeing Co. boiler blowdown from Olives Paper Mill Limited and trade effluent from Macphersons Paints Limited. The total consented volume for these industrial discharges is relatively small compared with the NWW STW's.

There are also a number of small treatment plants operated by others.

The locations of these discharges are shown on Map 9.

Intermittent Effluents

There are over 80 identified storm and emergency sewer overflows within the Upper Irwell Catchment. Their locations are shown on Map 9.

Surface run-off from the significant urban areas within the catchment is clearly a major intermittent effluent.

2.7.3 Environmental Objectives

- To control continuous and intermittent discharges in such a way as to permit achievement of the water quality objectives for the catchment.

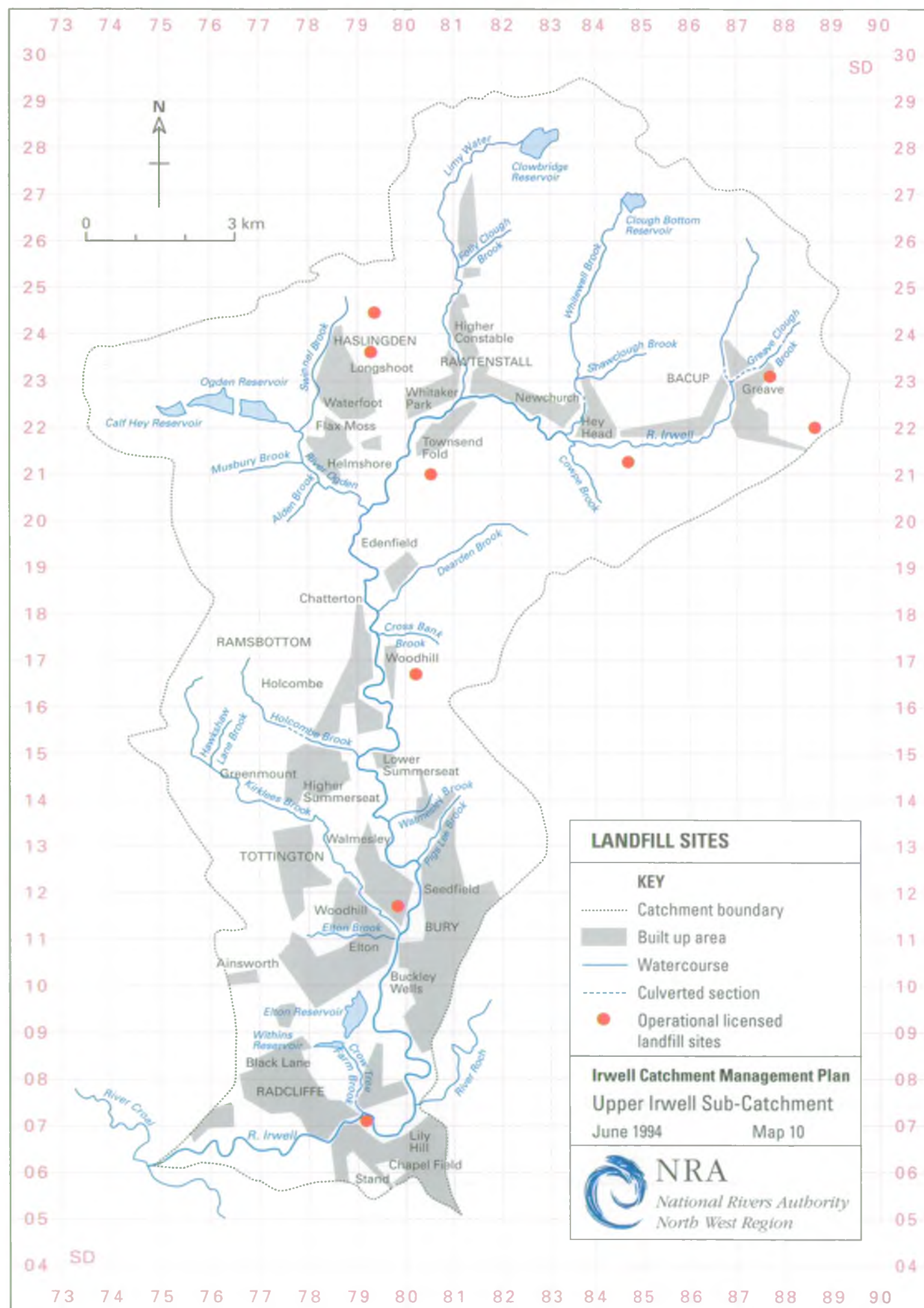
2.7.4 Environmental Requirements

Water Quality:

- No deterioration in water quality upstream of discharges that would increase their impact.

Water Quantity:

- No significant diminution in flows upstream of discharges that would increase their impact.



2.8 LANDFILL SITES (MAP 10)

2.8.1 General

The NRA is a statutory consultee on Waste Disposal matters. It is also a statutory consultee of Planning Authorities under the Town and Country Planning Acts. A valid planning permission is the means by which aftercare provisions, including surface water drainage and flood protection measures where appropriate, on closed landfill sites can be regulated. The Waste Disposal Licence relates to the operational phase of any site.

It is recognised that a wide range of waste disposal operations require a Waste Disposal Licence. These include scrap yards, transfer stations, incinerators, waste storage, etc. Often the greatest threat to groundwater quality is posed by landfill activities.

2.8.2 Local Perspective

Each site is considered on an individual basis, the location of a site must not pose an unacceptable risk to water resources.

A waste disposal licence for a site must specify engineering measures to be taken so as to minimise the potential for any leachate generated to escape. In addition, a monitoring regime designed to confirm the integrity of the containment structure must be specified.

2.8.3 Objectives

- To ensure landfill activity does not compromise water quality or water resources and proceeds in accordance with advice given in the Groundwater Protection Policy.
- To safeguard existing standards of flood protection to land and property downstream of surface water discharge points from landfill sites.

2.8.4 Environmental Requirements

Water Quality:

- Compliance with EC Directives on dangerous substances discharged to groundwaters.
- Implementation of the NRA Groundwater Protection Policy.
- Prevention of pollution of controlled waters.
- Appropriate monitoring of effects on surface and groundwaters.
- No deterioration of groundwater or surface water quality.

Water Quantity:

- No detriment to the availability of water resources.
- Minimise loss of unsaturated zone cover to aquifers.

Physical Features:

- Minimise the occurrence of slipping.
- Maintenance of the integrity of the river channel adjacent to landfill sites.
- Restoration of all sites to an acceptable environmental standard taking into account the opportunities for conservation, recreation and amenity.
- Any necessary flood defence works should be carried out in an environmentally sensitive manner.
- Safeguard features of the water environment which are of ecological or landscape value.

2.9 MINERAL EXTRACTION

2.9.1 General

Mineral extraction can affect both groundwater quality and quantity. It can restrict recharge to an aquifer and divert flow. In addition, purification which occurs as water percolates through the unsaturated zone cannot occur if that zone has been removed by excavation. Subsequent use of mineral extraction sites for landfill also poses a significant threat to groundwater quality.

2.9.2 Local Perspective

Mineral workings are difficult to quantify within the Upper Irwell Catchment. Underground workings for coal are both numerous and extensive. Other minerals have also been worked underground locally, usually on a small scale. However, quite extensive sandstone extraction has taken place by underground methods in the Rawtenstall area. Many such workings are not recorded.

Surface mineral workings are likely to be widespread, and also largely unrecorded. The most common types are clay or marl pits, sand and gravel pits, hard rock (sandstone) quarries in outcrop areas and also occasional shale pits.

Many, if not most of such old workings may have long since been filled, often with waste from a variety of sources.

2.9.3 Objectives and Standards

Wherever possible, water resources must be preserved and protected. Mineral workings must be operated under the guidance given within the NRA's "Policy and Practice for the Protection of Groundwater".

2.9.4 Environmental Requirements

Water Quality:

- No deterioration of groundwater or surface water quality.

Water Quantity:

- No detriment to the availability of water resources.
- Minimise loss of unsaturated zone cover of aquifers.

Physical Features:

- Minimise the occurrence of slipping.
- Maintenance of the integrity of the river channel adjacent to extraction sites.
- Restoration of all sites to an acceptable environmental standard taking into account the opportunities for conservation, recreation and amenity.
- Safeguard features of the water environment which are of ecological or landscape value.

2.10 GROUNDWATER PROTECTION

2.10.1 General

Groundwater is a vital natural resource and under particular threat from the effects of human activity. Once polluted, groundwater is often difficult and very expensive to remediate. Therefore, preventing groundwater contamination is a major objective of the NRA.

The Authority's "Policy and Practice for the Protection of Groundwater" sets out a national framework for the protection of both groundwater resources in general and sources (abstractions) in particular from the potential polluting effects of mans activities.

The policy classifies groundwater vulnerability according to the nature of the overlying soil cover, the presence and nature of any drift cover, the nature of the strata and the depth to the water table.

It considers groundwater resources in terms of major, minor and non-aquifer, depending on their ability to yield water and support groundwater abstractions. However it emphasises the need to protect all groundwater, whether or not currently developed. The policy uses the concept of protection zones around sources of supply (wells, springs and boreholes) based on either distance or time of travel.

The first phase of groundwater protection zone delineation has now been completed for 86 North West Water Limited, public supply sources within the Region. The timetable for completion of zoning around the other public supply, industrial and other licence sources in the north west has yet to be determined.

2.10.2 Local Perspective

There is only one groundwater source used for public water supply within the Upper Irwell Catchment and it is not programmed for protection zone definition.

Conversely, it should be borne in mind that many private groundwater sources, both licensed and unlicensed are used for potable purposes. These are usually in areas more remote from the mains water distribution system, and associated with minor aquifers, for example, the Carboniferous Sandstones.

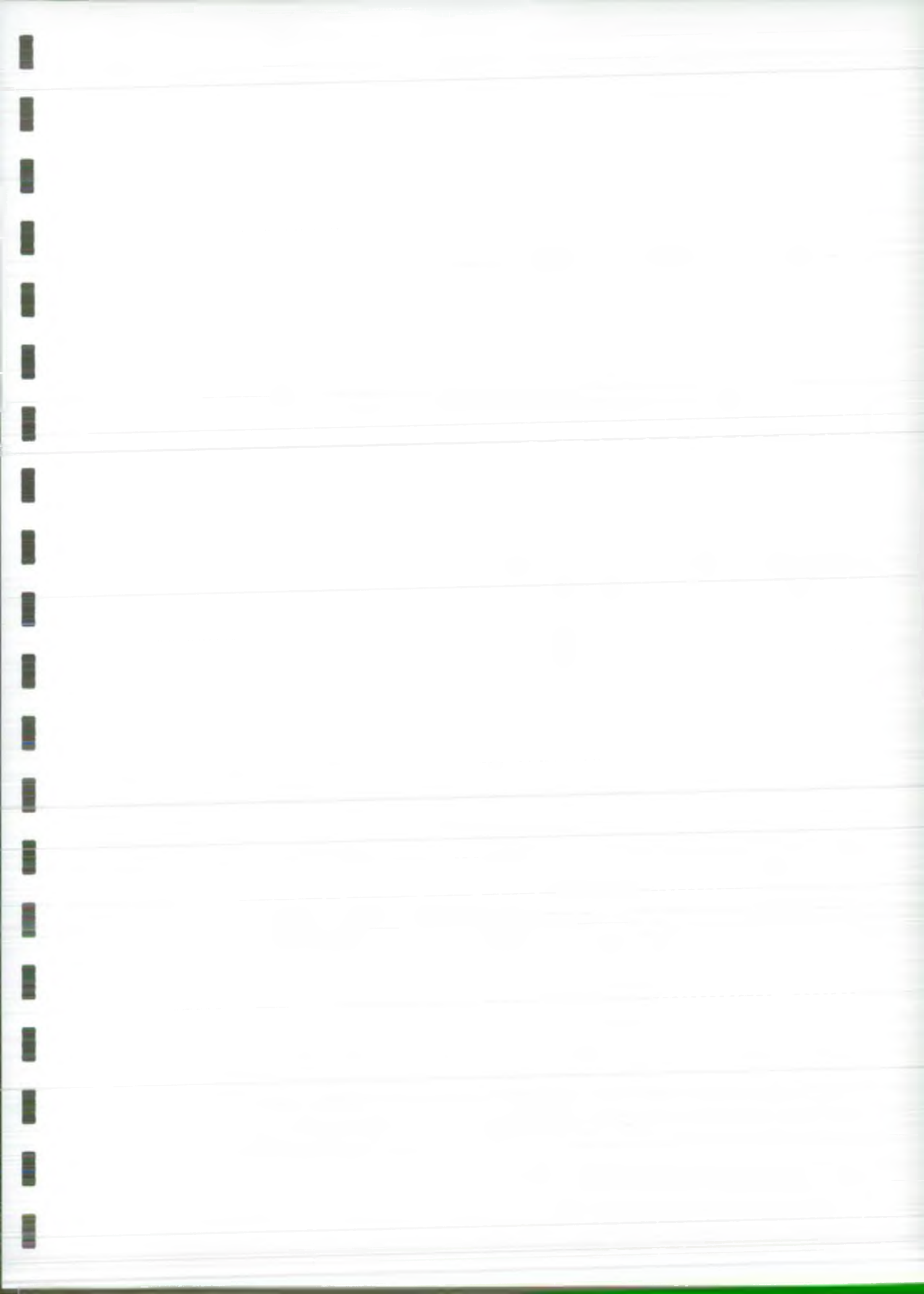
When available, source protection zone maps will be held in the NRA Regional Head Office at Richard Fairclough House, Warrington. The definition of zones is based on a wide range of variables and incorporates subjective judgement. In view of the need for frequent updating and amendment of these zones their general issue is not considered to be appropriate. Groundwater vulnerability maps intended to provide a simplified interpretation of the vulnerability and source protection across the catchment area and take account of known hydrogeological conditions and variations will be produced in due course. The National Policy document contains a series of Policy Statements setting out the NRA's approach to dealing with various types of development/land use activity, depending on the groundwater vulnerability.

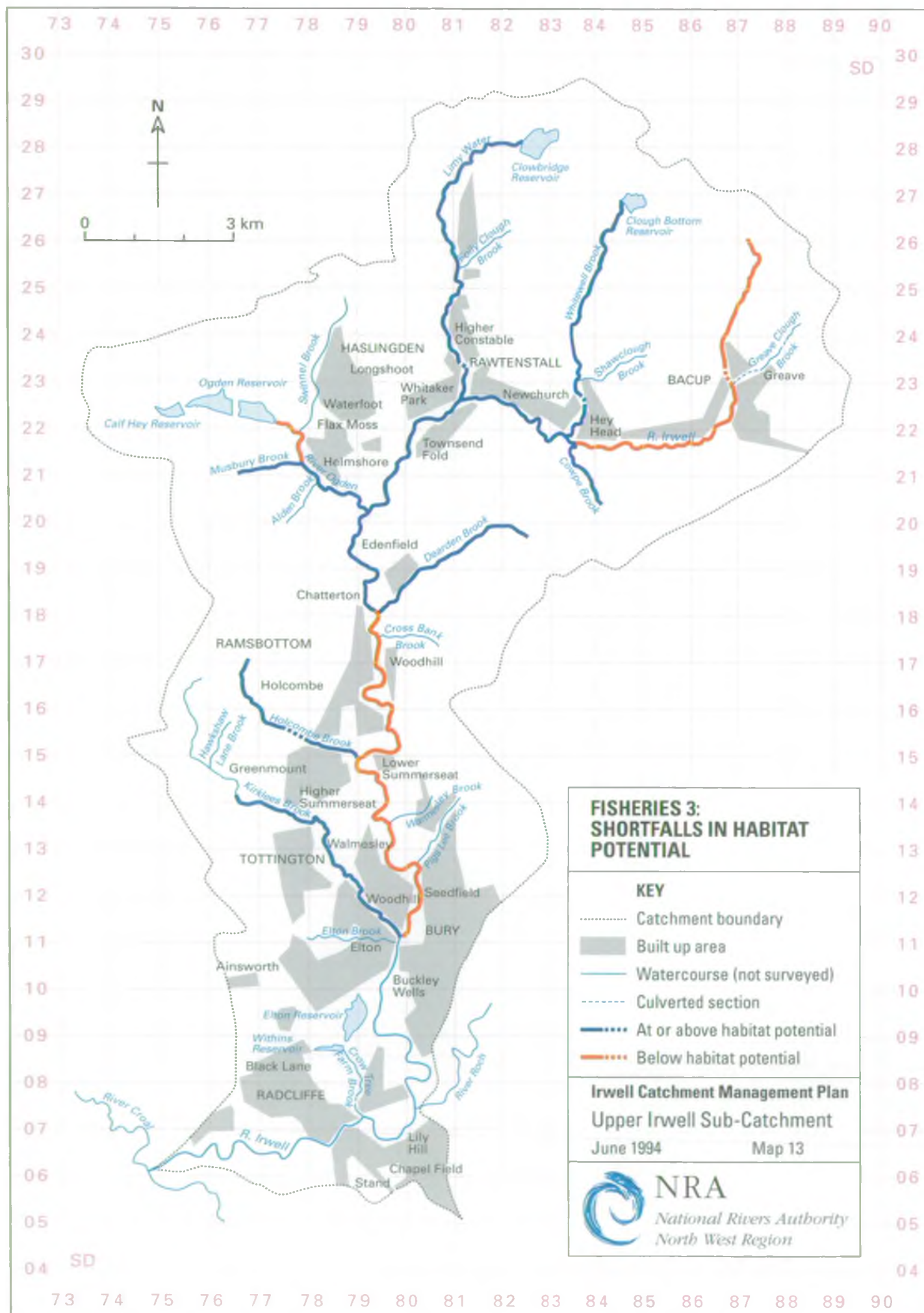
**CATCHMENT USES AND ACTIVITIES
GROUNDWATER PROTECTION**

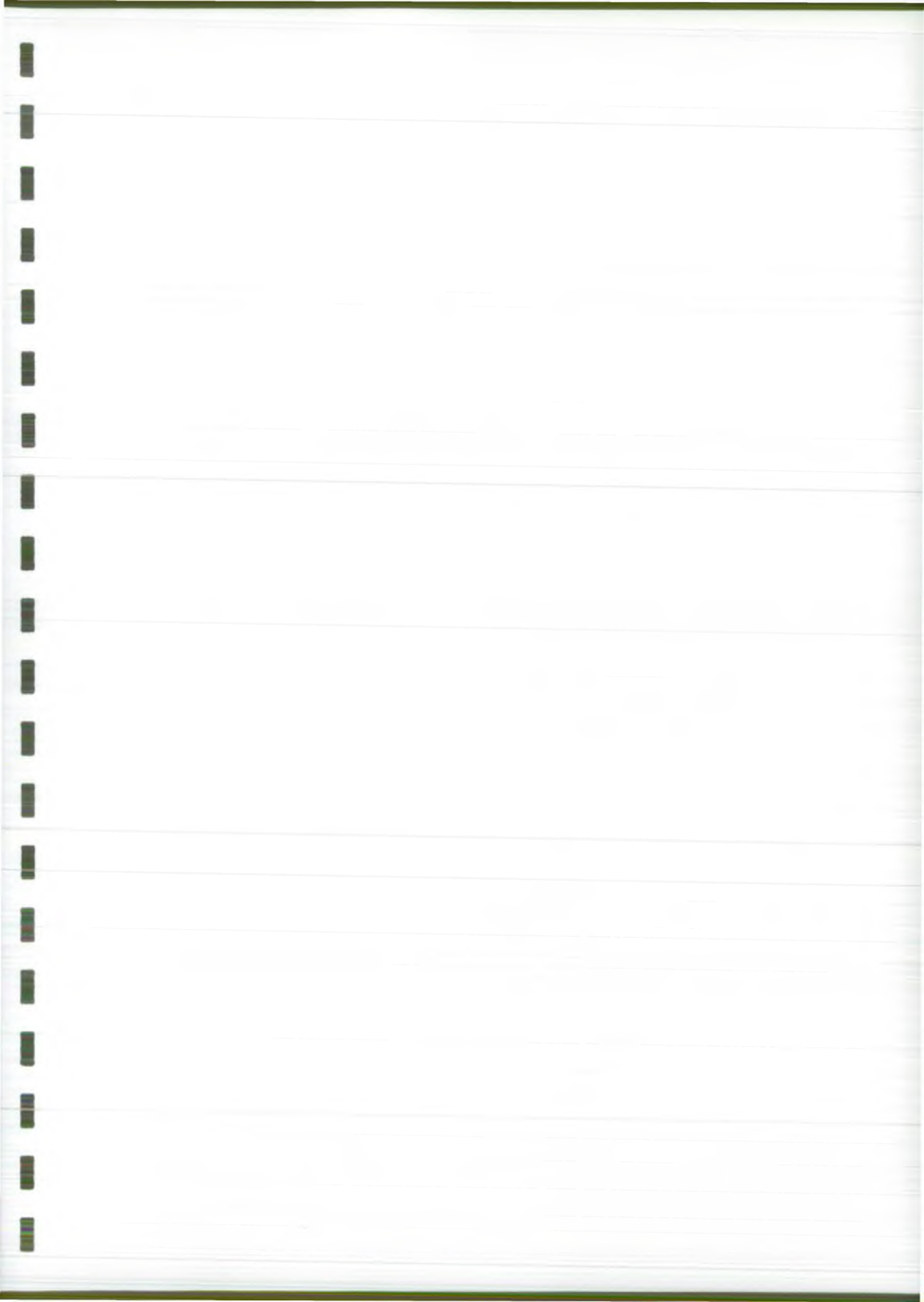
These activities include:-

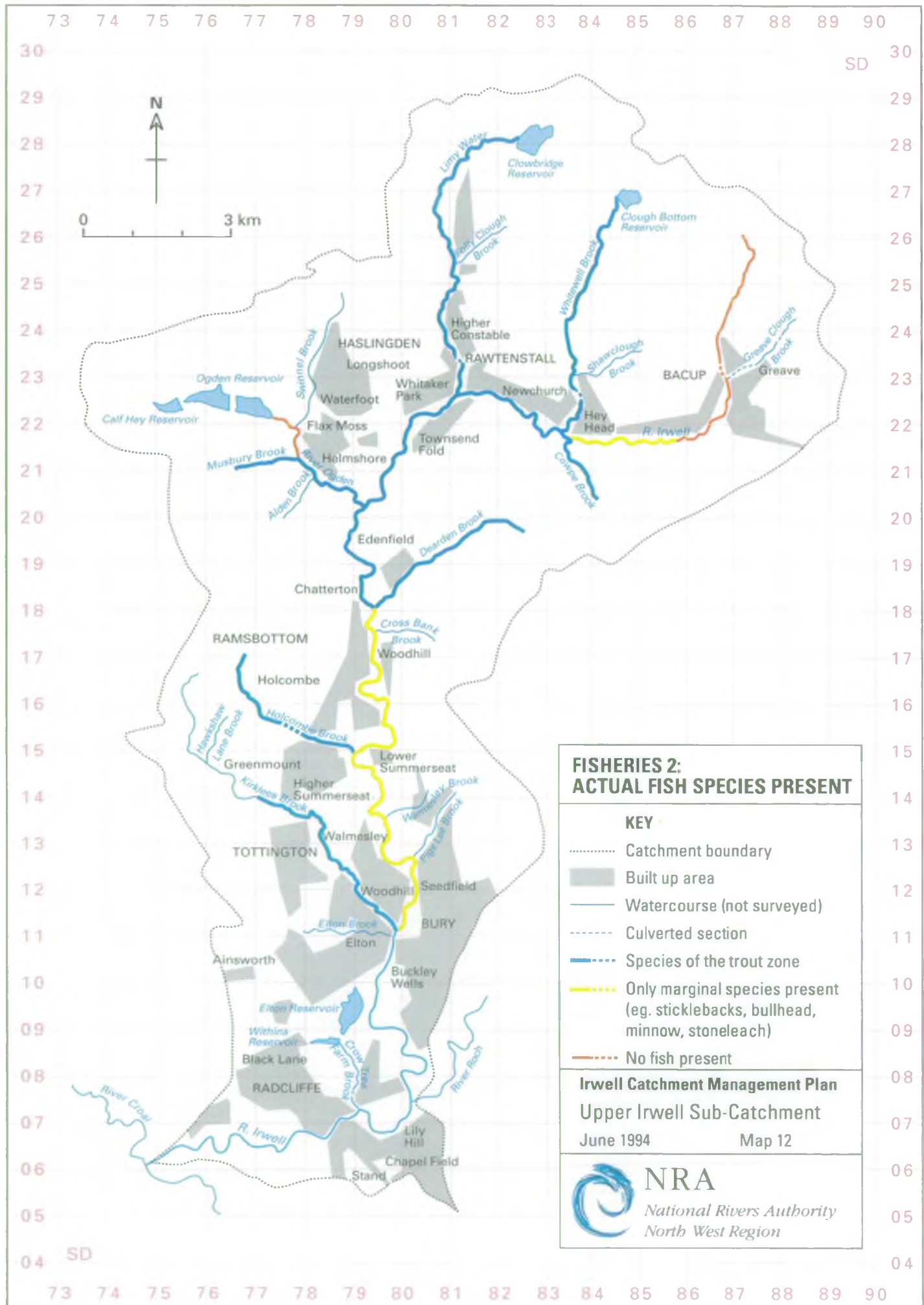
Groundwater abstraction
Waste disposal to land
Disposal of slurries and sludge to land
Physical disturbance of aquifers
Contaminated land
Diffuse Pollution

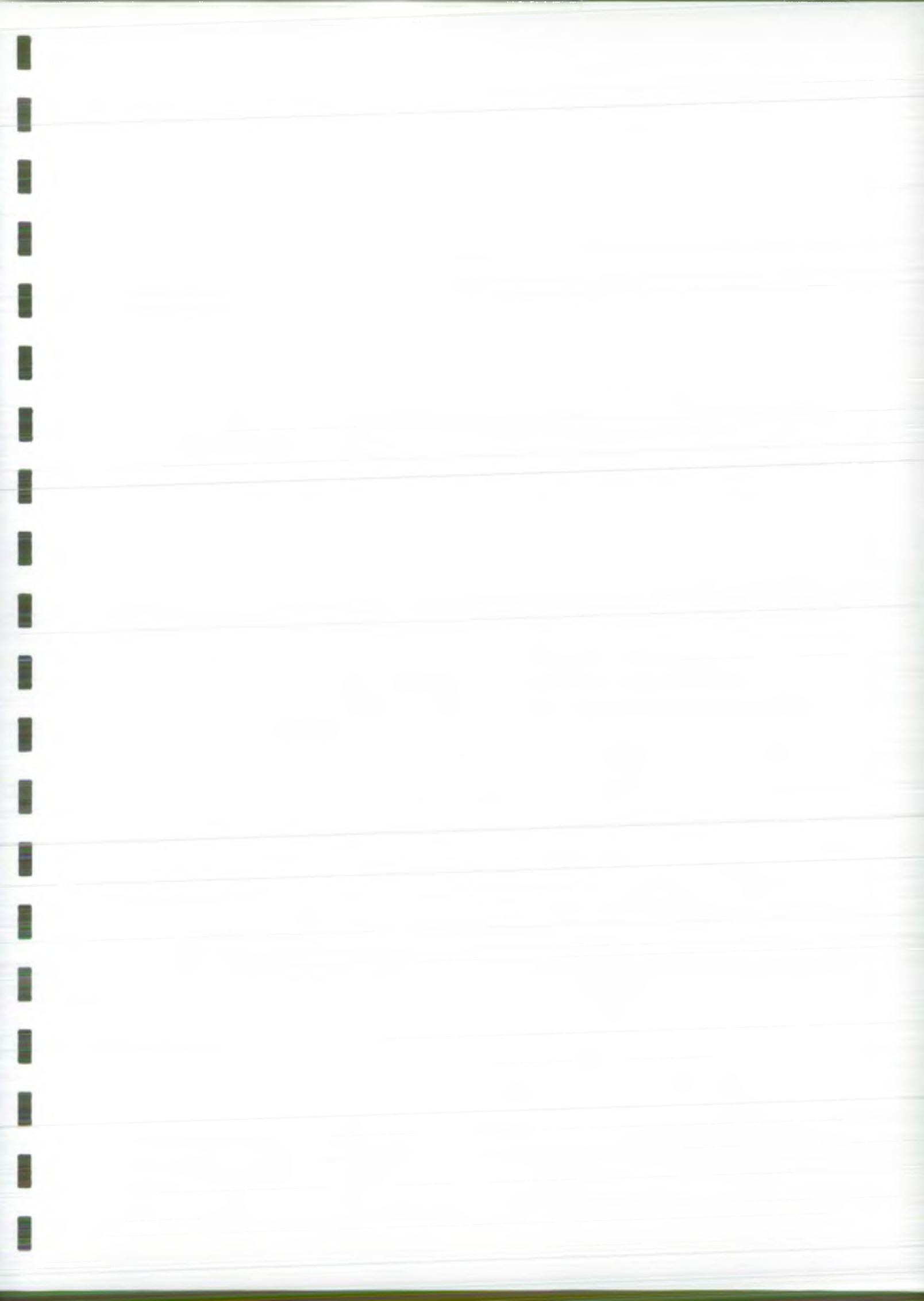
The underlying philosophy is, "Prevention is Better than Cure".

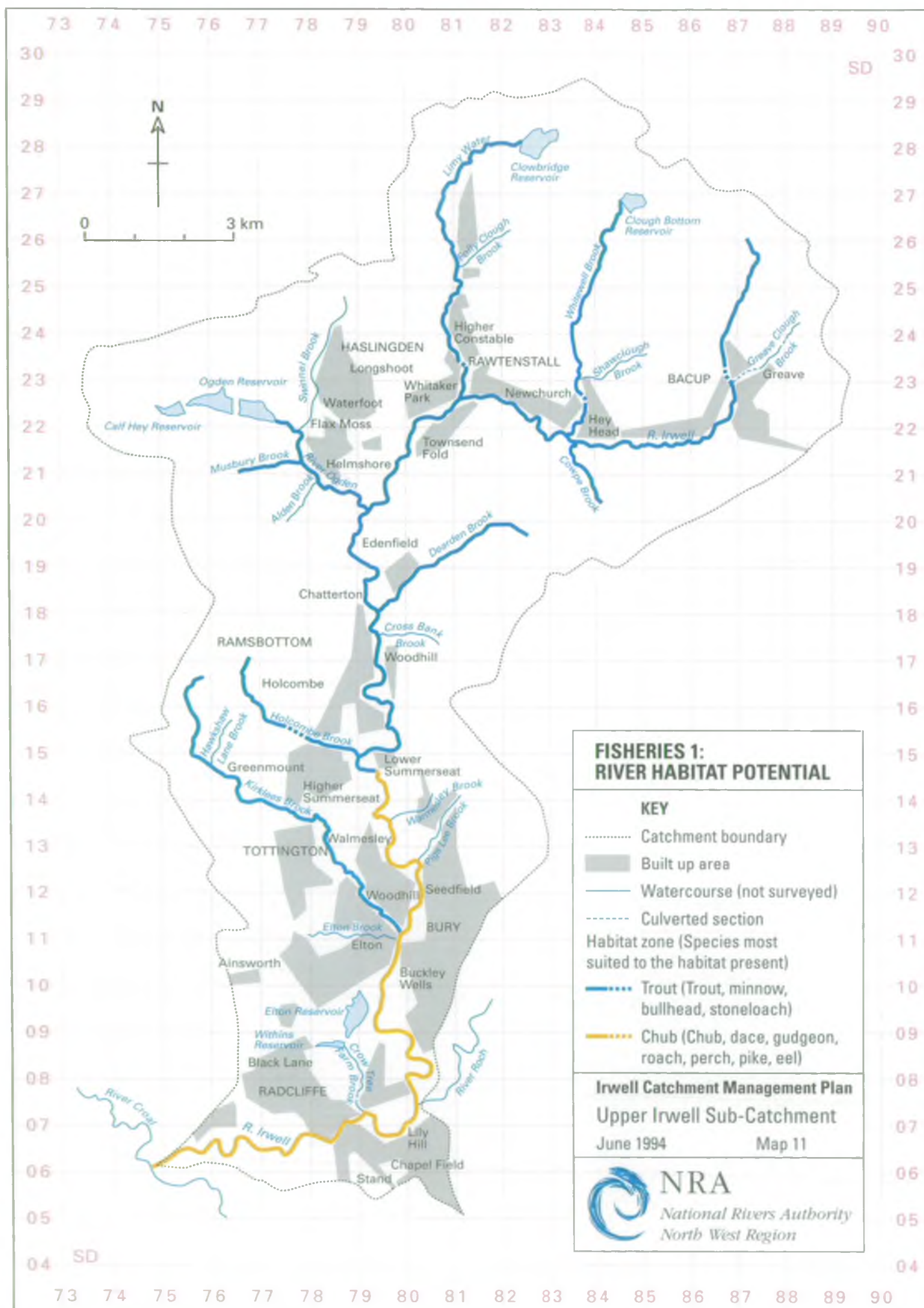












2.11 FISHERIES (MAPS 11, 12 & 13)

2.11.1 General

The use covers Game Fisheries, that is, the maintenance of breeding populations of salmonid fish species, namely brown trout in this catchment; and Coarse Fisheries, that is, the maintenance of breeding populations of coarse fish species.

The NRA has duties to maintain, improve and develop fisheries and to further the conservation of fish species. Fish populations are affected by the quality and quantity of water as well as by the availability of suitable physical habitat features. Fish are, therefore, important indicators of the overall health of the river.

2.11.2 Local Perspective

The NRA undertake fish population surveys on all rivers within a three year rolling programme. The results of these surveys can be summarised by the use of three coloured maps. The first map (Map 11) indicates the habitat potential or 'expected species' according to Huet's classification of rivers (1952)*. This is compared to a second colour map (Map 12) indicating the actual species present, (from the results of the survey), which enables the third map (Map 13), showing the shortfalls in habitat potential, as far as species composition is concerned, to be drawn. The data collected on the fish populations can be used to help classify and establish objectives for the river.

In general the Upper Irwell Sub-Catchment maintains good brown trout fisheries in its upper reaches, and some coarse fish populations lower downstream. This is consistent with the physical habitats present within the Sub-Catchment.

Data from the most recent fishery surveys, carried out during the autumn of 1992, indicated good native brown trout populations particularly in Whitewell Brook, Limy Water and the River Ogden. These populations were supplemented by the stocking of brown trout by the resident angling clubs.

Within the River Irwell itself, upstream of Nun Hills, near Bacup, no fish were recorded, and downstream of Nun Hills the populations were restricted to minor coarse fish species. Brown trout were recorded downstream of Whitewell Brook, increasing in density to Stubbins, but further downstream into Ramsbottom only few minor coarse fish species were present.

The River Irwell downstream of Ramsbottom is difficult to survey because of its size, but local information from bailiffs suggest that the river supports only small isolated populations of coarse fish.

* Huet, M. (1952), *Biologie, Profils en Long et en Travers Des Eaux Courantes* Bulletin Francais De Pisciculture 175, 41-53.

2.11.3 Environmental Objectives

The overall objective is to develop and sustain a natural fish population appropriate to the catchment.

2.11.4 Environmental Requirements

Water Quality:

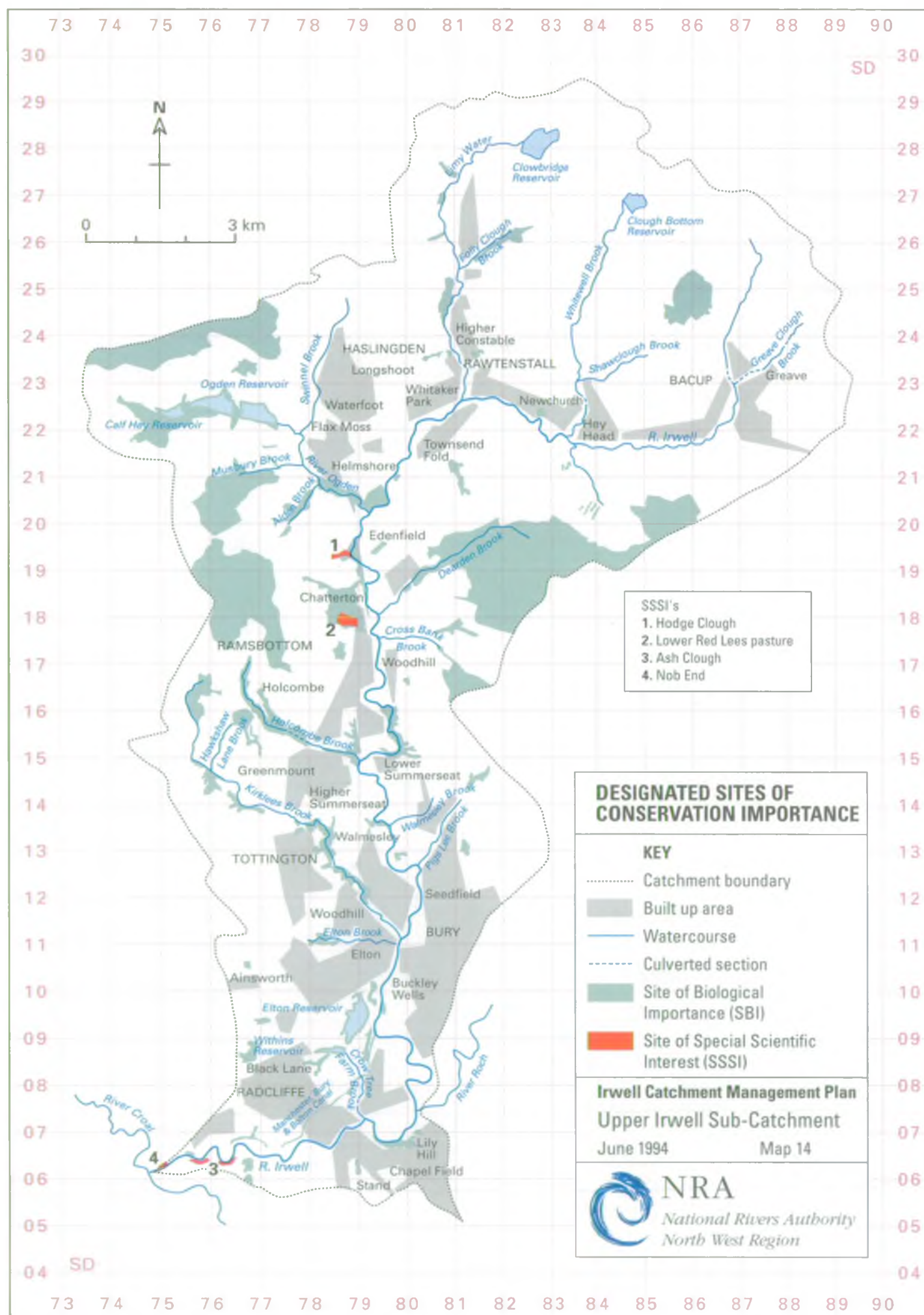
- River stretches suitable for brown trout are to be maintained within the limits for pollutants as specified in the EC Fisheries Directive (78/659/EC) for salmonid fish or by future SWQO's, whichever is appropriate.
- The remaining river stretches downstream to the demarcation points to be maintained within the limits for pollutants as specified in the same EC Directive but for coarse fish species, or by future SWQO's, whichever is appropriate.

Water Quantity:

- A variable flow regime where the monthly average flow reflects the natural flow conditions in the river. The natural mean monthly flow not to decline below the historic monthly Q90 except during drought conditions.

Physical Features:

- A diversity of natural river features to ensure a variety of habitat to maximise the production of fish populations including riffle/pool sequences and weed beds for feeding, spawning etc.
- The presence of bankside vegetation to provide adequate shade and cover.
- To ensure that river maintenance operations have a minimal deleterious impact on fish populations and enhance river habitat diversity where practical.



2.12 CONSERVATION (MAP 14)

2.12.1 General

This use relates to the conservation and enhancement of wildlife, natural beauty and geomorphological features in the river corridors. Conservation covers both designated sites and the wider countryside associated with rivers and the water environment.

2.12.2 Local Perspective

The River Irwell is a significant river in the context of Greater Manchester. The large number of designated conservation areas associated with the watercourses gives some indication of their value.

There are many valuable habitats, within the dramatically incised valley and the wide varied bed, between the confluence with the River Croal and Radcliffe. Two particularly important exposed scarps form Ash Clough geological SSSI. Here, as elsewhere within the catchment, extensive natural regeneration and tree planting have masked some of the destructive effects of historical industry. Landscaping of tipped areas has generally given rise to mediocre immature habitats. Nob End SSSI, however, is an old Leblanc waste tip that has naturally developed a rich calcareous flora. Lower Hinds, a similar tip upstream of Bury has not retained the same ecological interest.

The Irwell is probably of least conservation value through Radcliffe and parts of Bury where the backs of tall buildings crowd to the bank top.

Between Bury and Summerseats there are notable lengths of wooded corridor and banks, scrub, flushes and marshy areas. Due to the size of the channel there is some ecological interest in the river bed, although apart from weirs and mid channel islands much of the flow is quite uniform. However much of the adjacent and bankside habitats are degraded and under development pressure.

Upstream of Ramsbottom potential habitats in the narrow valley bottom have been replaced by ribbon developments along main transport routes. However, development has generally not extended up the steep wooded banks and acid moorland slopes which characterise the river corridor. Moreover significant numbers of bankside trees and rock outcrops remain.

Many of the banks are reinforced with stone walls. The walls themselves are often of local conservation value. However there are more natural features in the unwallled sections. Variety in width and flow, vertical earth cliffs, undercut banks and exposed tree roots are of particular value.

The geology of the catchment has given rise to the river bed of boulders, cobbles and gravel eroded and deposited to form the shoals, riffles, pools and deeper slack water which are of such conservation value.

Limy water, Whitewell Brook and the River Ogden are very similar in character to the Upper Irwell.

Most of the tributaries are constrained by development towards their confluence with the River Irwell. They are generally most unspoilt upstream, where they are less accessible to main roads and railways. The sites of old mills are frequently overgrown and their lodges and mill ponds have developed into valuable habitats.

This is particularly true of Dearden Clough, the downstream section of Dearden Brook. The brook drains off the imposing Scout Moor, is of extremely high local conservation and geomorphological interest and a designated SBI.

Kirklees Brook is of considerable local conservation interest and much of it is designated SBI. Upstream is a series of meadows with a diverse flora, uncommon regionally. The Kirklees-Valley downstream is characterised by a large number of lodges and an interesting range of industrial and semi-industrial habitats. The river corridor is of a poorer quality through the most industrial stretches where the brook is walled and culverted. However the channel itself is of conservation value. For example, dippers feed from the large number of weirs and riffles and kingfishers benefit from overhanging branches.

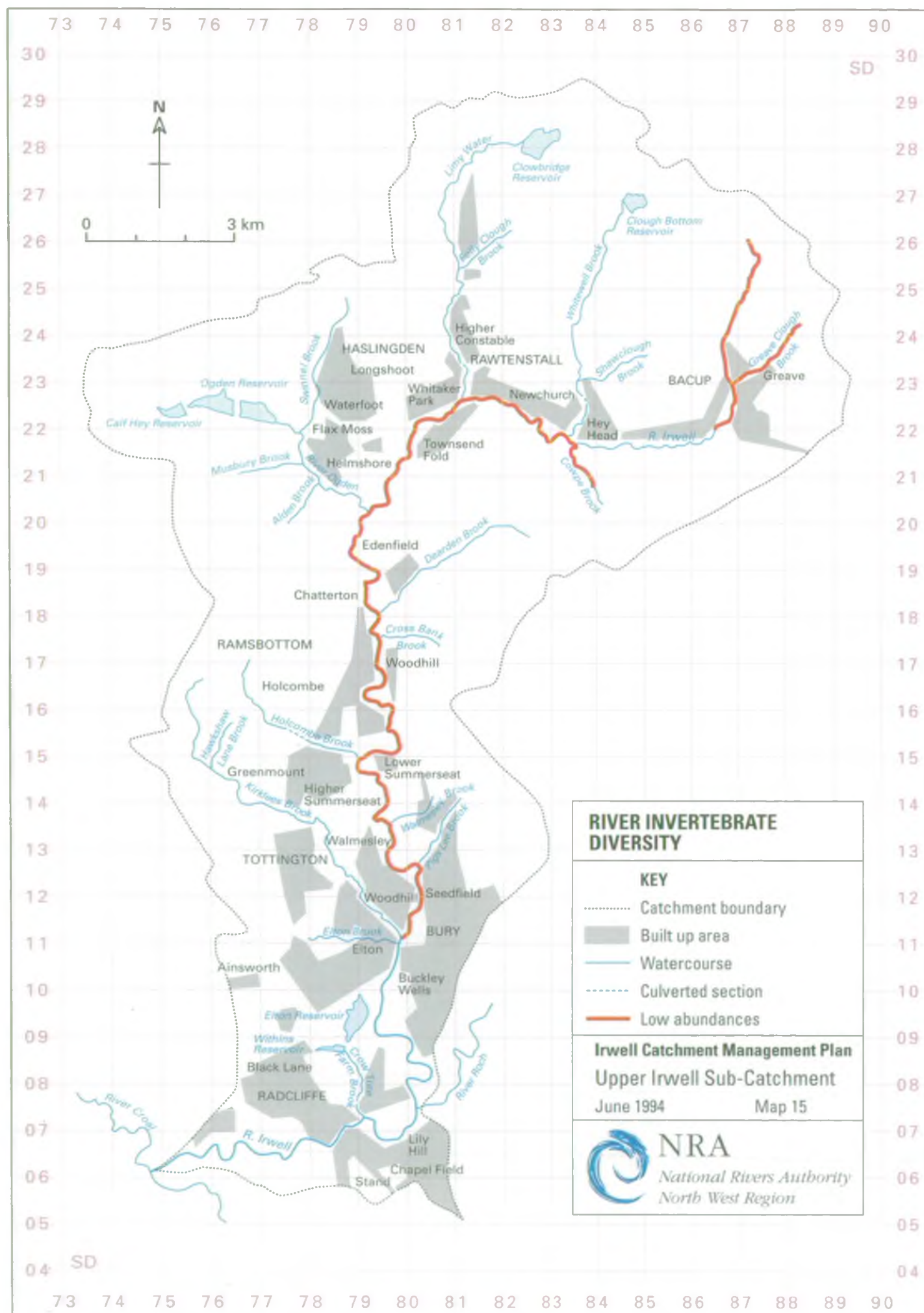
Holcombe Brook is also of high conservation interest. The predominantly wooded corridor with steep rocky banks and valley sides is designated SBI for its whole length. Its character is affected by the two on line reservoirs. There are also some very diverse overgrown millponds.

A number of smaller tributaries such as Elton Brook, Crow Tree Farm Brook and Pigs Lee Brook have been particularly degraded by development. They have been constrained by building to the bank top and devalued by unsympathetic bank works.

The number and extent of culverted sections has fragmented the riverine environment and lead to a loss of open water and river valley habitats. This is partly under the sites of the many old waterpowered mills which occur throughout the catchment. There are particularly long stretches along the Irwell and half of Greave Clough through Bacup; part of Pigs Lee Brook through Carr Bank; over half of Elton Brook under a playing field, an industrial area and a tip in Bury and part of Alden Brook through Sunny Bank.

There are many opportunities for enhancement within the catchment. Re-development of a site containing a culvert presents a good opportunity of opening up the watercourse to create an attractive water feature. This would remove a barrier to fish and wildlife and restore continuity in the river corridor.

Opening up culverts as part of river restoration schemes may be possible in certain circumstances. The most suitable sites are those which run through uncontaminated green space with scope for the re-introduction of meanders. Other sites may be too deep and involve removal of too much spoil.



A notable feature of the catchment is the large number of lodges, ponds and reservoirs. These provide a range of standing water habitats which often support a rich emergent and aquatic flora and fauna not found in the faster flowing and sometimes more polluted watercourses. A number of the reservoirs are particularly important for water fowl. Eight have been designated SBI's. Many assemblages of smaller lodges are also designated.

As well as any intrinsic interest they are also very important in maintaining a desirable flow regime and ecological interest through many of the watercourses. The flow in 8 of the 16 tributaries is regulated by large reservoirs at their heads. Some tributaries such as Kirklees and Holcombe Brooks are affected by on-stream impoundments further downstream.

2.12.3 Aquatic Invertebrates (Map 15)

In the upper reaches of many of the Irwell tributaries: Whitewell Brook; Limy Water; Cowpe Brook; Kirklees Brook and the River Ogden in particular, the aquatic invertebrate communities are diverse and consist of a wide variety of species including pollution sensitive stoneflies, mayflies and caddis flies. This is not, however, the case in the headwaters of the Irwell itself, or in Greave Clough Brook, also in the upper reaches of the catchment. This area is heavily influenced by the effects of minewater discharge and the aquatic invertebrate communities present consist of small numbers of a few pollution tolerant organisms such as Chironomidae midge larvae and Tubificidae worms.

Below Bacup invertebrate diversity shows some improvement towards the Cowpe Brook confluence, with an increase in species variety and a notable presence of the mayfly Baetidae. However, there is a dramatic increase in diversity in the lower reaches of Cowpe Brook and this situation, periodically, occurs in a section of the River Irwell from below the Cowpe Brook Confluence to the confluence with Kirklees Brook. This is believed to be linked, certainly in part, to the presence of pesticides in the river.

Downstream of Kirklees Brook some recovery is evident. Diversity is still restricted but there is an increase in the abundance of the pollution tolerant organisms, particularly Asellidae the freshwater hog louse.

2.12.4 Environmental Objectives

The overall objective is to retain or recreate natural rivers within open, continuous river corridors, which are as wide as possible with a diverse range of habitats and physical features for people and wildlife.

This is to be achieved by:-

- retention of existing features of conservation interest.
- actively promoting the enhancement of the river corridor, wherever possible/desirable.
- seeking effective mitigation for any loss of conservation features.
- safeguarding the special conservation interest for which sites have been designated.

2.12.5 Environmental Requirements

Water Quality:

- Water quality not to deteriorate to a level such that sites of high local conservation value lose their general aquatic interest, for example, Kirklees Brook and Dearden Brook.
- Water quality improvement in some sites would enhance an existing conservation value, for example Holcombe Brook and the River Ogden.

Water Quantity:

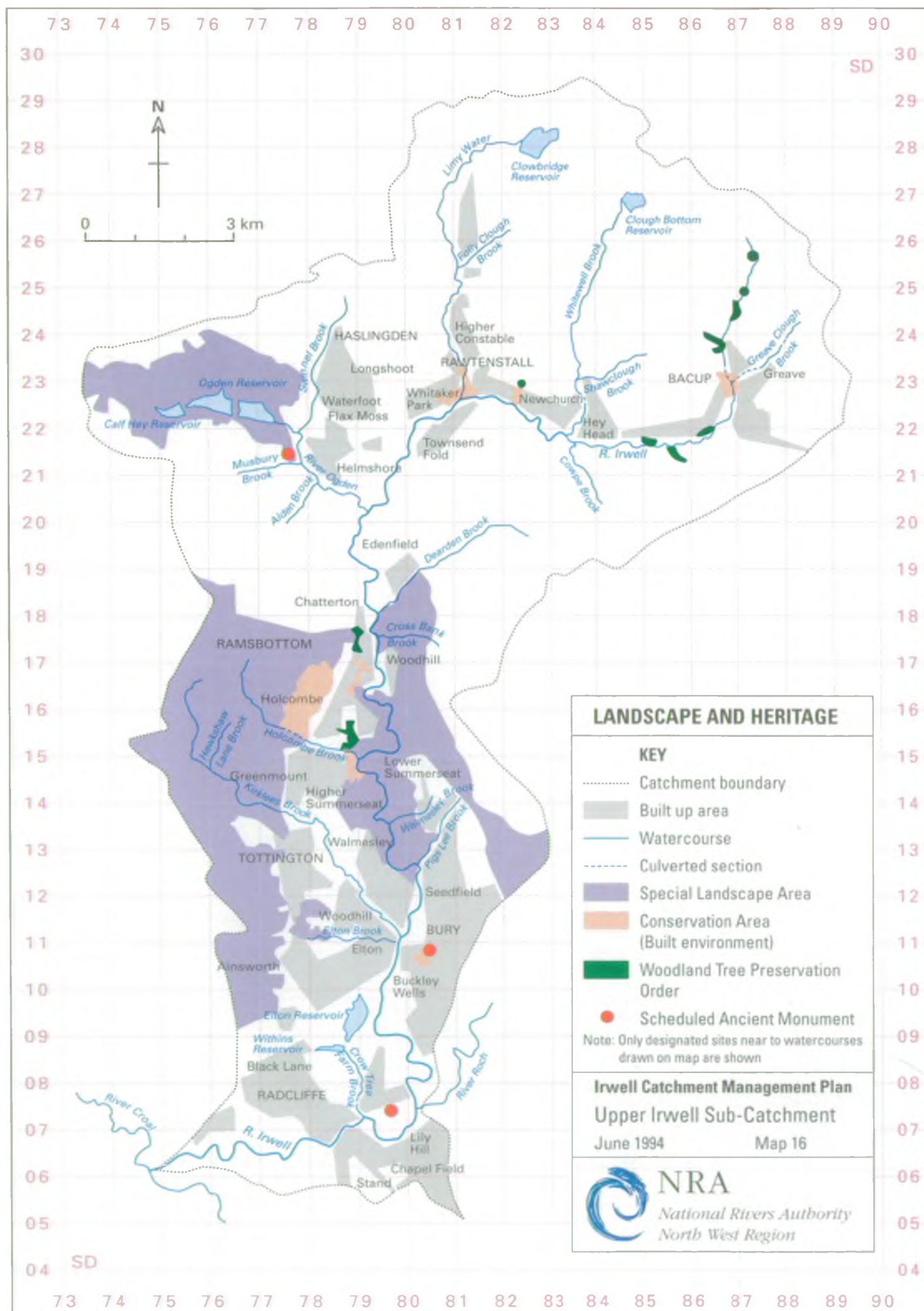
- A variable flow regime where the monthly average flow reflects the established or natural flow conditions in the river. The mean monthly flow not to decline below the established monthly Q90 except under drought conditions.
- Maintain the hydrological link between the river and its flood plain where appropriate. The water table to be maintained at a high level where possible but particularly where wetlands occur. Spate flows should be allowed to inundate certain wetlands.
- Spate flows to naturally cleanse the river channel.

Physical Features:

- The maintenance and enhancement of the diversity of natural river features such as meanders, earth cliffs, areas of erosion/deposition, pool/riffle sequences and the presence of aquatic vegetation and marginal (water's edge) vegetation.

CATCHMENT USES AND ACTIVITIES CONSERVATION

- The maintenance and enhancement of a diversity of river corridor habitats including marsh, ponds, fringe/overhanging vegetation, bankside trees and hedges, species-rich bank vegetation, grassland and woodland. In addition, the conservation of the features which give rise or contribute towards the specific features of the designated conservation areas.
- The channel cross section to be appropriate for the river flow regime.



2.13 LANDSCAPE AND HERITAGE (MAP 16)

2.13.1 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. Areas of Outstanding Natural Beauty, Scheduled Ancient Monuments as well as locally valuable sites.

2.13.2 Local Perspective

The sub-catchment contains much high quality landscape, some of county importance formally designated as Special Landscape Areas (mostly moorland). Urban fringe areas of similar value within Rossendale Borough are designated as being of Local Landscape Value.

River character will be influenced by past and present land use and the extent of channelisation works. Within developed areas the river will generally be physically restrained in terms of bank reinforcement, channel straightening and deepening.

Of the 91.9 km of main river, 51% runs through developed areas. This is mainly ribbon style development along the narrow valley floors linked to the areas industrial past. Stone walls feature highly as an intrinsic part of the local landscape character, alongside numerous mills and weirs.

The Rossendale Draft Local Plan identifies the borough as having limited woodland coverage (2% compared to 9% nationally) and has highlighted Woodland Priority Areas. In the sub-catchment area, 19% of the main river length is bounded by woodland on one or both banks, concentrated along the tributaries and the Irwell upstream of Bury. It is likely that riverside woodland is a significant part of the areas woodland resource.

Within Rossendale, the main river valleys are designated as "Greenlands" to act as linear open space routes for recreation and wildlife. The Irwell Valley is an important recreation route for the area.

The archaeological interest of the area is complex with many potential sites still undiscovered. The sub-catchment contains three Scheduled Ancient Monument sites. There are several conservation areas (built environment) along the river valleys again highlighting the high visual amenity of the area.

The NRA hope to support riverside regeneration initiatives including renovation of significant or historical buildings especially if they include the provision of riverside walkways and use of local or natural materials.

2.13.3 Environmental Objectives

The overall objective is to conserve and enhance the natural beauty of rivers and to conserve their heritage value.

This is to be achieved by:

- retention of existing landscape character and features
- seeking effective mitigation for any loss of landscape quality
- liaison with Local Planning Authorities and the Countryside Commission to discuss assessment and enhancement of river landscape quality
- liaison with Local Planning Authorities to ensure that high quality river landscapes are adequately protected across planning authority boundaries
- supporting initiatives to conserve heritage features
- liaison with the County Archaeological Unit for all NRA capital and heavy maintenance schemes.

2.13.4 Environmental Requirements

Water Quality:

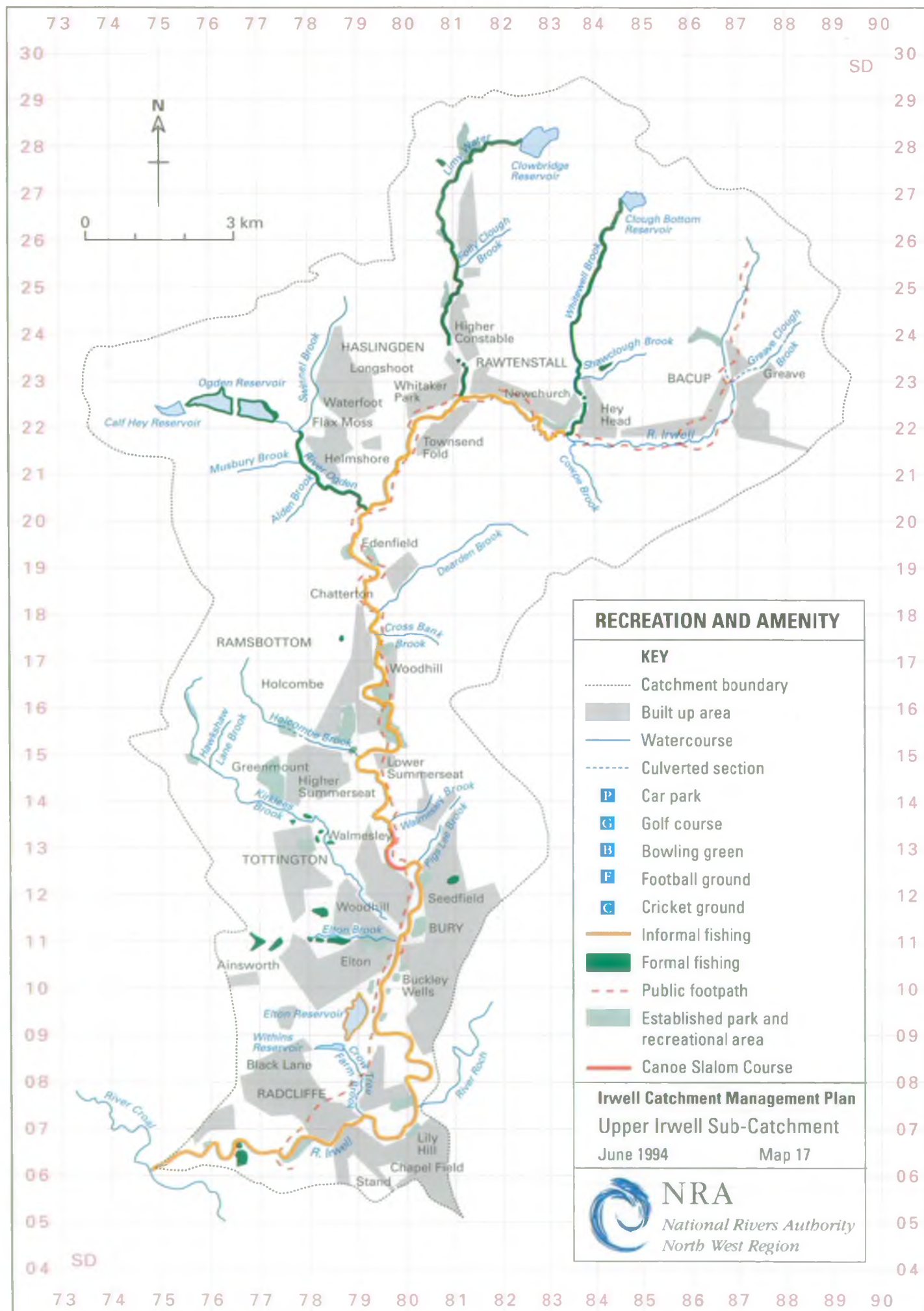
- To be aesthetically acceptable i.e. water to be free from surface films, extraneous floating material, discolouration and unpleasant odours. -
- Not to deteriorate to a level such that sensitive heritage sites lose their interest.

Water Quantity:

- A flow regime which reflects the natural or established flow conditions in the river.
- The water table to be maintained so as not to damage sensitive heritage sites.

Physical Features:

- To be in keeping with the local landscape character. In general to conserve and promote a diversity of natural features within the river valley and along the river corridor.
- Historic features and landscape types to be conserved, with restoration and interpretation as appropriate.



2.14 RECREATION AND AMENITY (MAP 17)

2.14.1 General

This use deals with those sports such as canoeing, where intimate contact with the water occurs and also general waterside recreation such as walking.

2.14.2 Local Perspective

There are several well established recreational areas adjacent to the River Irwell which increase the overall amenity value of the watercourse such as Nuttall Park, Ramsbottom. Many of the recreational sites are managed by a warden service which is involved in actively promoting amenity and recreation pursuits in the catchment.

In the upstream areas much of the surrounding land is urbanised with residential development giving a general low amenity value and recreational interest. However, occasional pockets of open space are used for informal recreation.

Besides the availability of short footpaths, public access is well catered for. There is a long distance footpath, approximately 30 miles in length, which follows the river valley known as the Irwell Valley Way and brings the public into close proximity of the water environment.

Occasional stretches of the main river have been utilised as local canoe slalom courses, particularly downstream of Ramsbottom and around the Burrs area. The only other water related recreational activity within the catchment is sailing which occurs at Elton Reservoir.

Still waters and canal lengths throughout the catchment are used for angling, pond dipping and general educational uses.

2.14.3 Environmental Objectives

- To obtain suitable water quality, water quantity, flow characteristics and physical river conditions, so as to provide a suitable environment for the types of recreational and amenity pursuits required by the local population and visitors to the catchment.

2.14.4 Environmental Requirements

Water Quality:

- Minimum requirement being the protection of the amenity value of the watercourse.
- Water to be free from surface films unnatural colour stable foam extraneous floating material and unpleasant odour.

Water Quantity:

- Basic flow regime including the operation of transfer and augmentation schemes, to minimise detriment to recreation and amenity.

Physical Features:

- Maintenance of existing footpaths.
- Maintenance of existing access points
- Enhancement of available facilities
- Promotion of increase in available facilities.

2.15 ANGLING

2.15.1 General

This use of the river specifically relates to the use of the catchment by pleasure anglers.

2.15.2 Local Perspective

Currently both informal and formal angling is carried out throughout the catchment. There are numerous small still waters and lengths of canal, within the catchment area, that provide pleasure anglers with good quality coarse fishing.

Trout fishing is available at Ogden and Holden Wood reservoirs which are controlled by the local Haslingden and District Angling Club. The angling club also controls fishing along the River Ogden.

Limy Water and Whitewell Brook are two of the main tributaries that are controlled by Lumb Vale Angling Club.

There are several other local angling bodies that fish the main river.

2.15.3 Objectives

- To provide suitable and safe conditions for successful angling within the catchment.

2.15.4 Environmental Requirements

Water Quality:

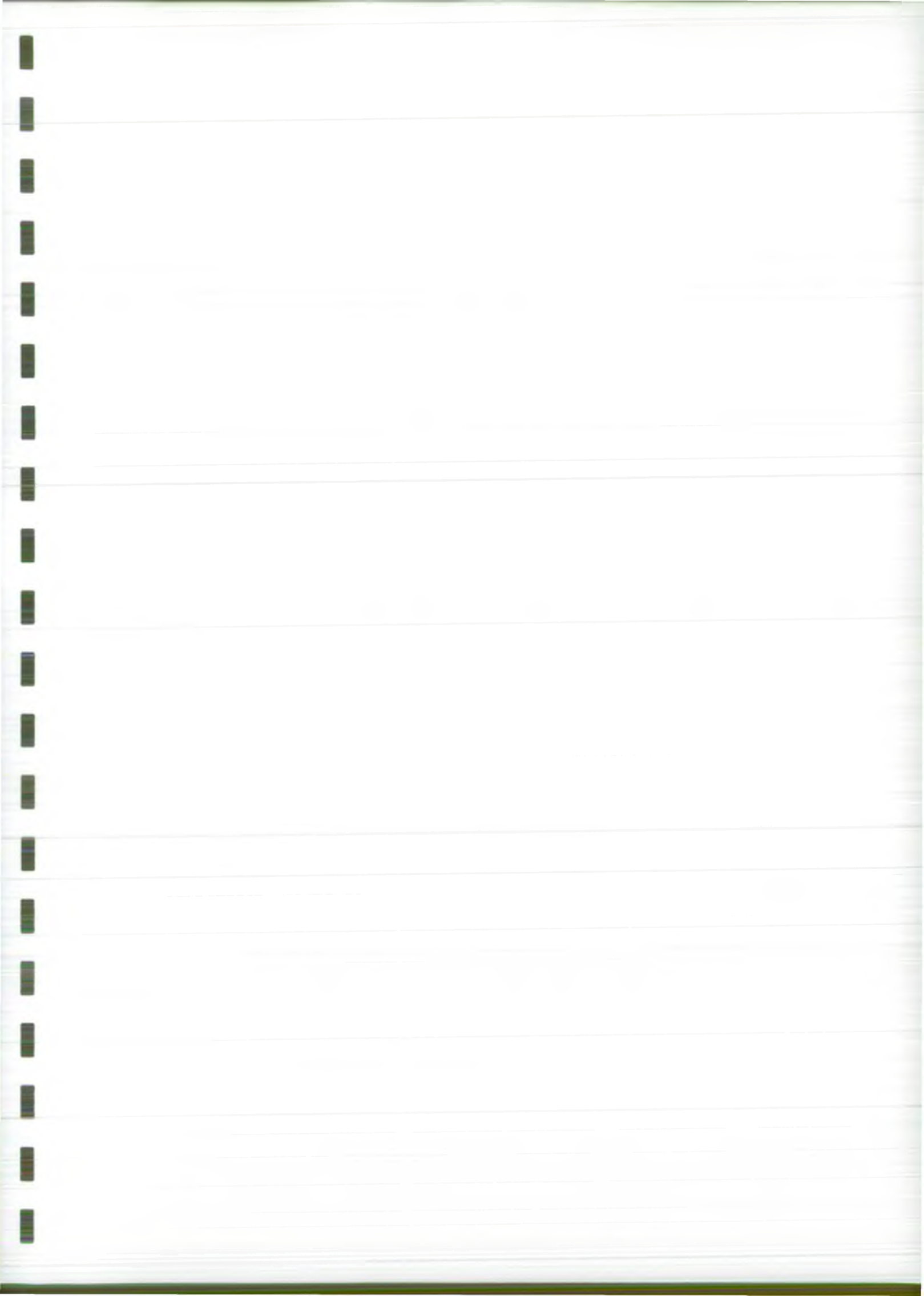
- To be of sufficient quality to comply with the basic amenity use of the water body.
- To be aesthetically acceptable in order to enhance angling, i.e., water to be free from surface films, extraneous floating material, stable foam, discolouration and unpleasant odours.
- To comply with appropriate water quality objectives for fisheries.

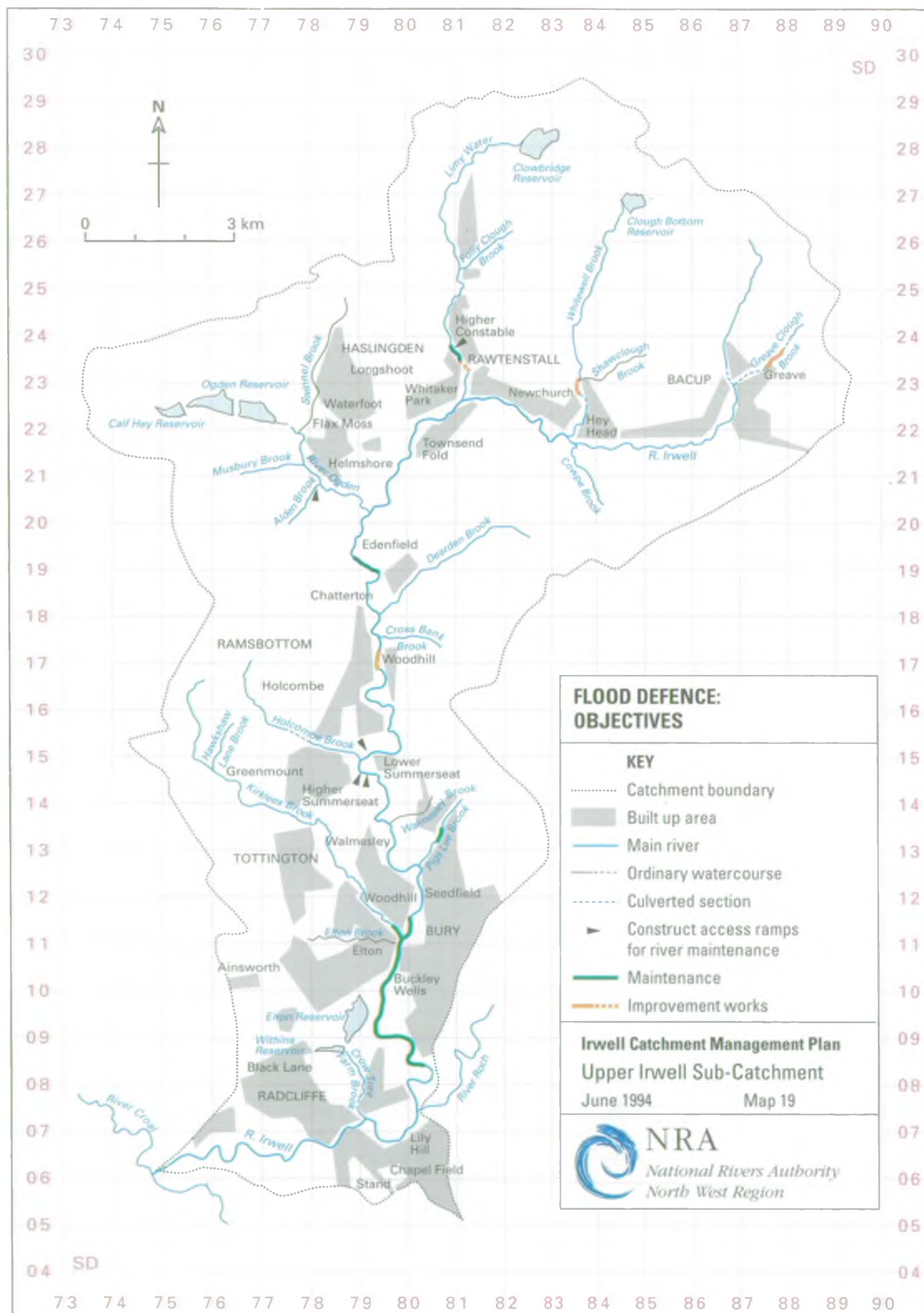
Water Quantity:

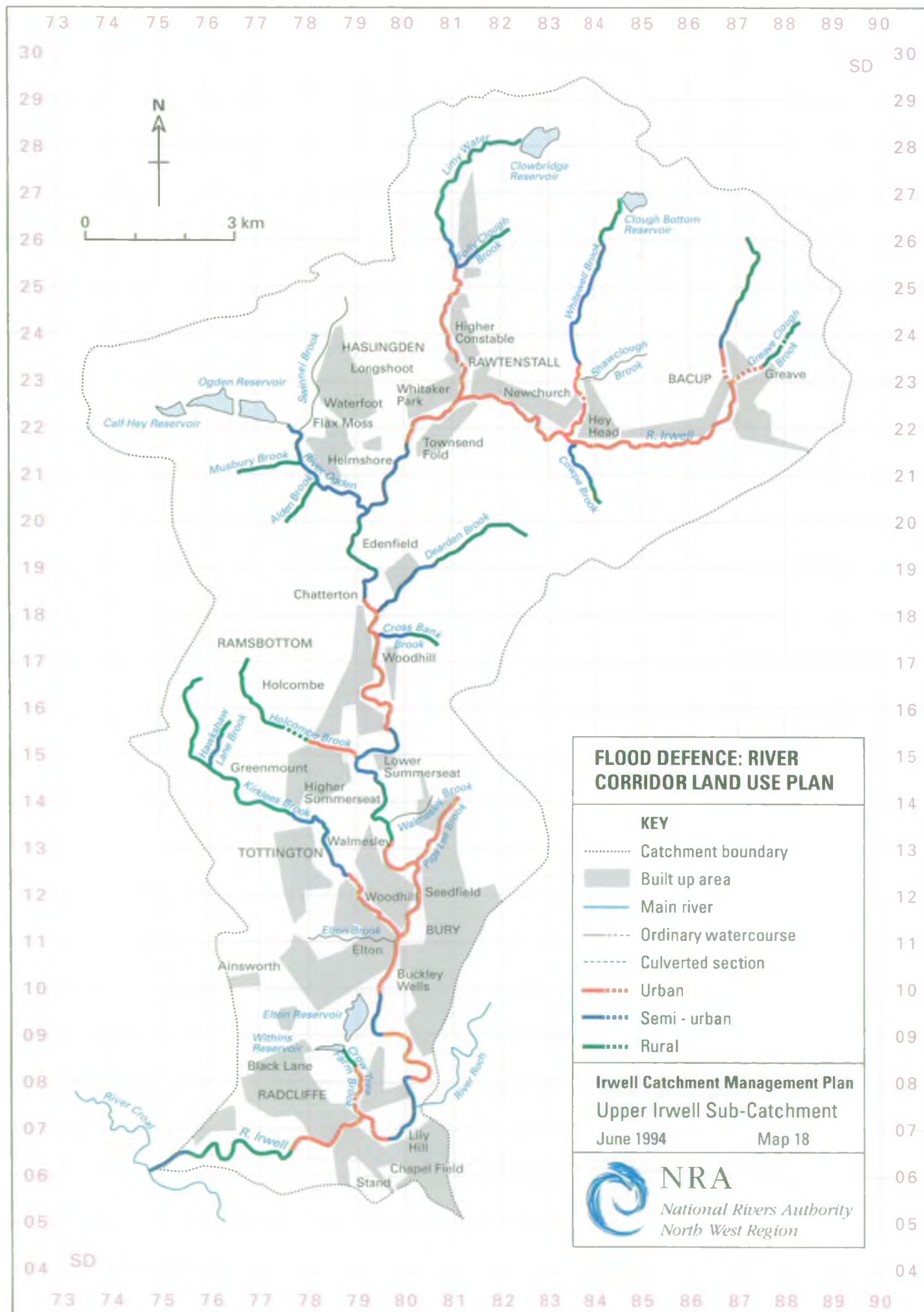
- A variable flow regime where the monthly average reflects the natural flow conditions in the river. The natural mean monthly flow not to decline below the historic monthly Q90 except during drought conditions.

Physical Features:

- The maintenance of sufficient access points for angling.
- The maintenance of a mixture of open water as well as in-stream and bankside vegetation.







3. CATCHMENT OBJECTIVES

3.1 FLOOD DEFENCE OBJECTIVES (MAPS 18 & 19)

3.1.1 General

The need for Flood Defence works is assessed using a number of criteria, which results in a benefit/cost figure. If the Scheme cost is greater than the benefits accrued (which include flood damage, transport disruption, emotional stress, etc.) then it is likely that no scheme can proceed.

Target standards for flood protection when carrying out maintenance or improvement works, can generally be defined in the following manner (Map 18):-

RIVER CORRIDOR LAND USE CLASSIFICATION

Classification	Definition	Target Standard of Protection (Years)
Urban	Medium to High density urban development containing both residential and non-residential property.	25 - 100
Semi-urban	Low density urban developments or rural communities, mixed with agricultural land.	10 - 25
Rural	Predominantly agricultural land, ranging from grass land to arable farming.	1 - 10

The Flood Defence objectives identified on the map are areas where it is considered likely that future works may be carried out (Map 19).

3.1.2 Objectives

In addition to the requirements identified on the map the following general requirements are also considered objectives for the catchment:-

- Ensure provision of suitable access for maintenance of the river channel and flood defences.
- Maintenance regime which encourages ecological diversity, whilst maintaining flood defence levels of service.
- Co-operation with others responsible to ensure river corridors are free from rubbish and other imported debris.
- Operation of flood defence structures to ensure protection of all identified uses.

3.2 WATER QUANTITY OBJECTIVES

3.2.1 General

This section considers the requirements for both meeting existing and future abstraction water demand in the catchment and for minimum residual flows (MRF's) and minimum control levels (MCL's) to protect in-river needs.

3.2.2 Objectives

Water Abstraction:

The NRA has yet to establish formal policy with regard to supply objectives but the following targets will be considered, and in many cases are already being actively pursued:-

- a) To meet all reasonable demands to the Authority's stated levels of service within quality criteria described in the Authority's Water Quality Objectives.

The use - related levels of service are as follows:-

Public Water Supply:

- risk of hose pipe ban restrictions not greater than 1 year in 10
- need for voluntary savings of water not greater than 1 year in 20
- risk of standpipes not greater than 1 year in 100.

Spray Irrigation:

- risk of restriction not greater than 1 year in 12.

- b) To set MRF's and MCL's to protect the in-river needs.

- c) To ensure the best utilisation of water resources and the efficient use of water within the catchment.

Surface Waters:

In sub-catchments where there is significant water abstraction, minimum flow and level controls are necessary to ensure the resource is not over-committed in dry or drought years at the expense of other water users. Provisionally a general MRF equivalent to the 90 percentile flow (that flow which is exceeded 90% of the time) may be used as a target flow at points on the river. In retained water level reaches MCL's are also set to ensure minimum depths of water.

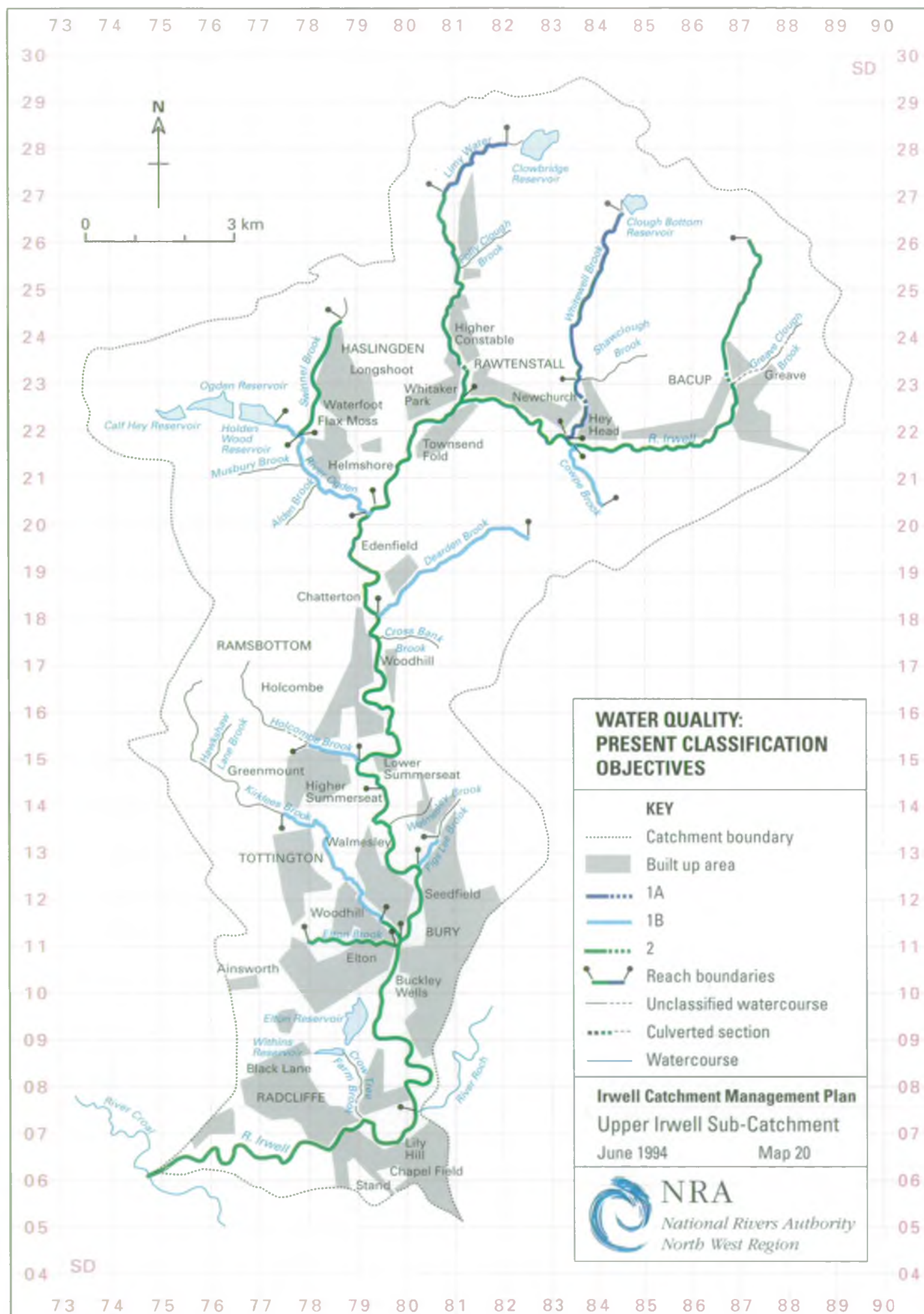
In some sub-catchments MRF's at specific locations may be required to provide dilution for effluent discharges.

Local Hydrometric Objectives:

The hydrometric information gathered in the Upper Irwell catchment has two principal uses within the NRA. Firstly, to provide warning of potential flooding further downstream on the Irwell flood plain by monitoring river levels and rainfall in this upper catchment. Secondly, to provide river level information for water quality monitoring purposes for the industrial and urban areas within the catchment. Short term, there are local needs to provide river levels and rainfall information for specific projects including setting water quality and quantity standards and flood defence improvement works.

Groundwaters:

In dry/drought summer conditions, spring flow discharges from groundwater aquifers to sustain surface water flows. Areas which require particular protection from any long term groundwater level decline need to be specified. General protection from long term level decline is required over the whole area to protect existing uses and users of groundwater.



3.3 WATER QUALITY OBJECTIVES (MAPS 20 & 21)

Objectives relating to water quality can be categorised as relating to domestic UK classification schemes or arising from EC Directives.

3.3.1 Water Quality Classification

a) Present Water Quality Classification Objectives - National Water Council (NWC) Classification

The NWC system of water quality classification was established in the 1970's. Inland watercourses are classed as 1A, 1B, 2, 3 or 4 in descending order of quality.

Class 1A and 1B watercourses could support a game fishery other factors being favourable whereas Class 4 waters are so grossly polluted as to be likely to cause nuisance.

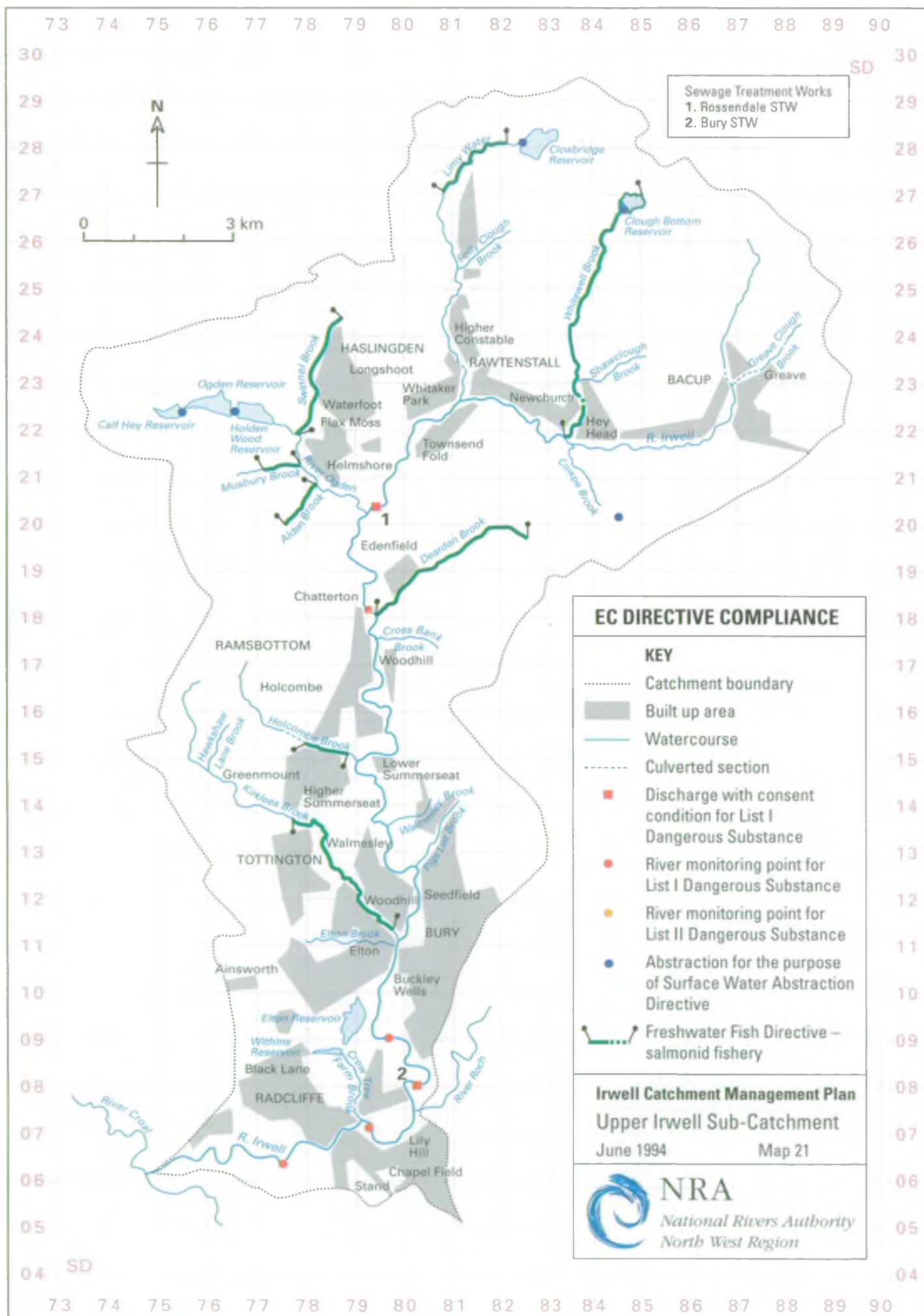
Watercourses are assigned to Class on the basis of the chemical parameters, dissolved oxygen, Biochemical Oxygen Demand (BOD) and ammonia with due regard to the results of monitoring of benthic invertebrate fauna.

In 1979 stretches of watercourse throughout England and Wales were defined and targets, Long Term Objectives (LTOs) or River Quality Objectives (RQOs), in terms of the NWC Classification system assigned to them. The minimum target assigned was achievement of Class 2 quality which should support a coarse fishery. The target achievement date was 2010 with an emphasis on eliminating Class 4 watercourses by 2000. Incorporated within this is the policy of no deterioration in the quality of controlled surface waters. Some amendments have been made to the stretch definitions since 1979 and these are included for the purposes of this report.

There are 19 defined classified reaches within the Upper Irwell Catchment and they are shown together with their NWC-objectives on Map 20.

b) Future Water Quality Classification Objectives - Statutory Water Quality Objectives (SWQOs)

Proposals have been made in recent years for a system of legally binding targets based on the uses to which a watercourse could legitimately be put. These will supersede the NWC Long Term Objective targets. Statutory Water Quality Objectives involve classification systems of water quality required for different types of use and for use in assessing compliance for that use.



To date only the River Ecosystem classification system has been fully developed. The regulations defining the system received legal status on the 10th May 1994. Objectives under this classification system will be set for stretches of watercourse in the near future. It is possible to relate the NWC Long Term Objective targets to the River Ecosystem classification system. It is envisaged that River Ecosystem objectives will be applied to stretches in a manner that where the water companies are affected no additional expenditure by them will be required over that which would have been required with the previously pertaining NWC Long Term Objective. Otherwise a direct translation will largely apply.

Classification systems for other uses are likely to follow.

3.3.2 EC Directives (Map 21)

Four Directives issued by the EC have implications for water quality in the Upper Irwell Catchment.

a) Directive on Dangerous Substances in Water

The Directive provides a framework for measures to control water pollution caused by discharges of certain dangerous substances sub-divided under List I and List II. Member States are required to take steps to eliminate pollution by List I substances and reduce pollution by List II substances.

In the UK Environmental Quality Standards have been established for concentrations of these substances in watercourses. Limits for discharges containing the substances have been set accordingly with regard to the dilution available.

The locations of river monitoring points and of discharges with consent conditions for Dangerous Substances in the Upper Irwell Catchment are shown on Map 21.

b) Directive on Urban Wastewater Treatment

The Directive specifies requirements for the collection and treatment of industrial and domestic wastewaters at sewage treatment works and for treatment of wastewater from certain sectors of industry prior to direct discharge to watercourse.

The interpretation in the UK will mean that all significant inland STW will almost certainly already comply with all the requirements relating to treatment.

However the requirement that collecting systems (the sewerage network) shall be designed, constructed and maintained in accordance with best technical knowledge not entailing excessive costs specifically regarding the limitation of pollution of receiving waters due to storm (and emergency) overflows presents very significant objectives to be met. Over 80 overflows have been identified within the Upper Irwell catchment with regard to this requirement.

With regard to direct discharges from the specified sectors of industry standards for the appropriate level of treatment are currently being developed. It is however unlikely that any of the direct discharges of industrial effluent within the Irwell Catchment will be affected by this requirement.

c) Directive on Water Quality for Freshwater Fish

The Directive sets Environmental Quality Standards for stretches of freshwater designated as suitable for either salmonids (salmon and trout) or cyprinids (coarse fish).

There are 8 designated stretches within the Upper Irwell Sub-Catchment. They are all of salmonid designation and are shown in Map 21.

d) Directive on Abstraction of Surface Water for Drinking

Amongst other requirements this Directive specifies standards for the quality of water abstracted for use as drinking water.

Five abstractions have been identified in the Upper Irwell Sub-Catchment for the purposes of this Directive and these are shown on Map 21.

3.3.3 Groundwater Protection Objectives

In December, 1992 the NRA issued its Groundwater Protection Policy. Groundwater is a vital natural resource and under particular threat from the effects of human activity. Once polluted, groundwater is often difficult and very expensive to recover. Therefore, preventing groundwater contamination is a major objective of the NRA. The Authority would like this policy to be viewed by all those whose activities may compromise groundwater quality, as a guide to assist and influence future planning strategy decisions. The document outlines the concept of vulnerability, that is the designation of areas of land where certain activities can have an appreciable affect on groundwater quality in an aquifer system and where pollution could quickly enter groundwater. It deals in particular with:-

- waste disposal land
- disposal of slurries and sludge to land

**CATCHMENT OBJECTIVES
WATER QUALITY**

- physical disturbance of aquifers affecting quality and quantity
- contaminated land
- diffuse pollution and unacceptable activities in high risk areas.

It is important to note that the definition of "controlled water" provided by the Water Resources Act, 1991 included groundwater. Therefore, statutory Quality Objectives for groundwaters will be developed by the NRA in the future.

3.4 PHYSICAL FEATURES OBJECTIVES

3.4.1 General

This section considers the general requirements for the physical features of the rivers and associated land of the catchment.

From the uses identified in Section 2, Physical Features Objectives have been defined as follows:

3.4.2 Objectives

Development Control

- Retain, recreate and enhance open green corridors along watercourses with a variety of features for people and wildlife. Effective river corridors should be continuous, and as wide as possible, to allow the free movement of wildlife and full enjoyment of their recreational potential.
- There should be no increase in flood risk as a result of development. No development in areas where the existing level of flood protection is considered below the target standard required for the type of development proposed.
- Ensure there are no new obstacles to the potential migration of fish.

Potable Water Supply, Agricultural and Industrial Abstraction

- Provide control structures and ensure efficient resource management. Promote winter storage facilities.
- Promote the use of soakaway/recharge drainage systems for proposed development.

Mineral-Extraction-and-Landfill-Sites

- All sites to be restored to an acceptable environmental standard and the creation of aquatic habitats promoted.
- Safeguard features of the water environment which are of conservation or landscape value.
- Safeguard the unique physical character and natural topography of the river valleys and flood plains.
- Maintain the integrity of the river channel adjacent to extraction sites.

Fisheries

- Endeavour to provide and maintain a diversity of natural river features to ensure variety of habitats to maximise the production of future fish populations.
- Maintain bankside vegetation to provide adequate shade and cover.
- Provision of fish passes around weirs and other obstructions to potential fish migration.

Conservation

- Promote the conservation and enhancement of healthy rivers with a diversity of natural geomorphological features, such as meanders, with areas of erosion and deposition, earth cliffs, undercut banks, pools, riffles, shoals, bars and islands.
- Protect and enhance the range of wildlife and semi-natural habitats found within the river corridors including flood plain habitats, old channels, marsh, ponds, marginal and overhanging vegetation, bankside trees and hedges, uncultivated buffer strips, species rich grassland and woodland.
- Promote less intensive farming in river corridors through initiatives such as countryside stewardship.

Landscape and Heritage

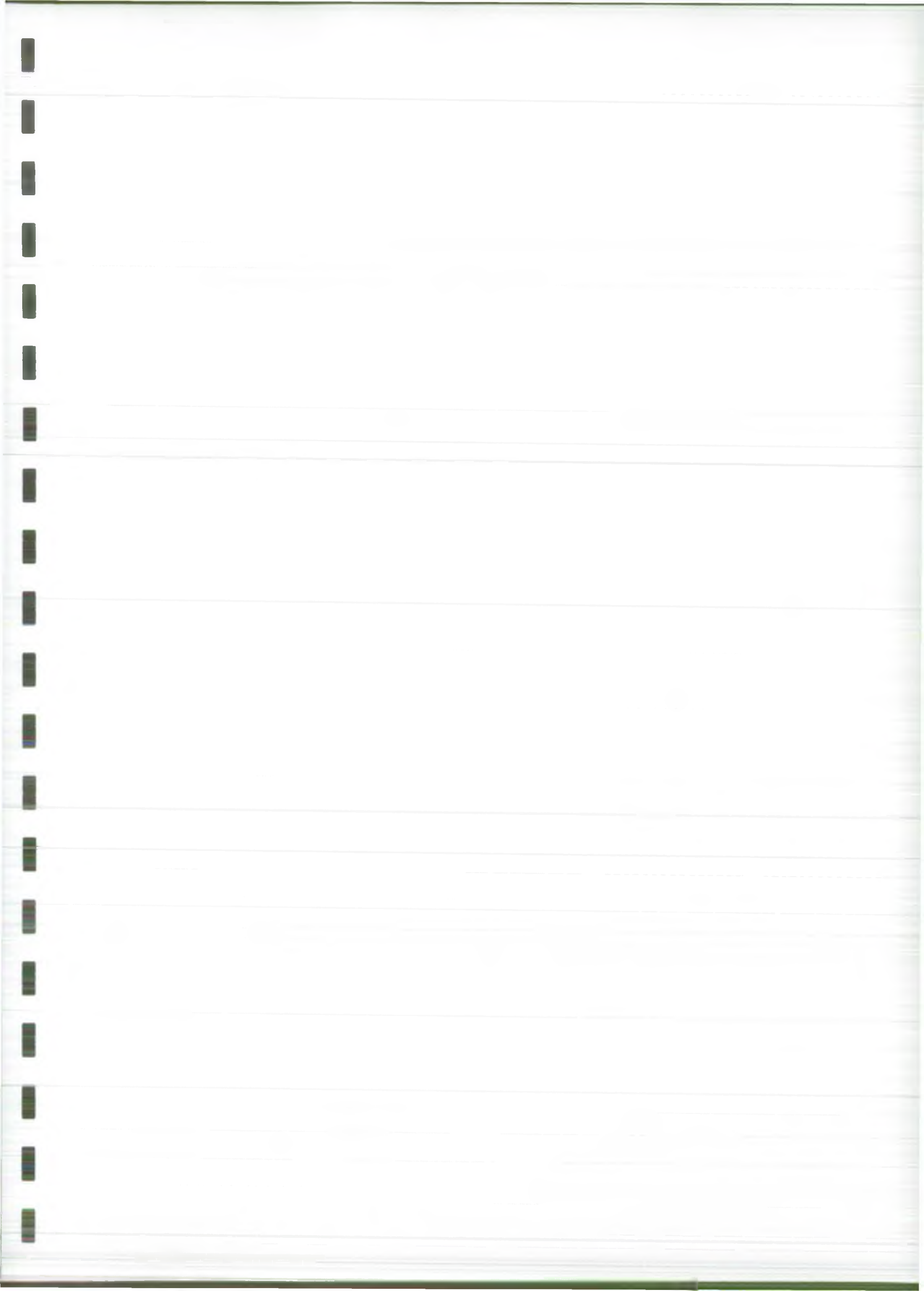
- Further, enhance and promote the natural beauty of the water environment.
- Safeguard those man-made features of the riverine environment that are of archaeological, historic, aesthetic or conservation value. For example, weirs, stone walls, mill races and old industrial buildings.

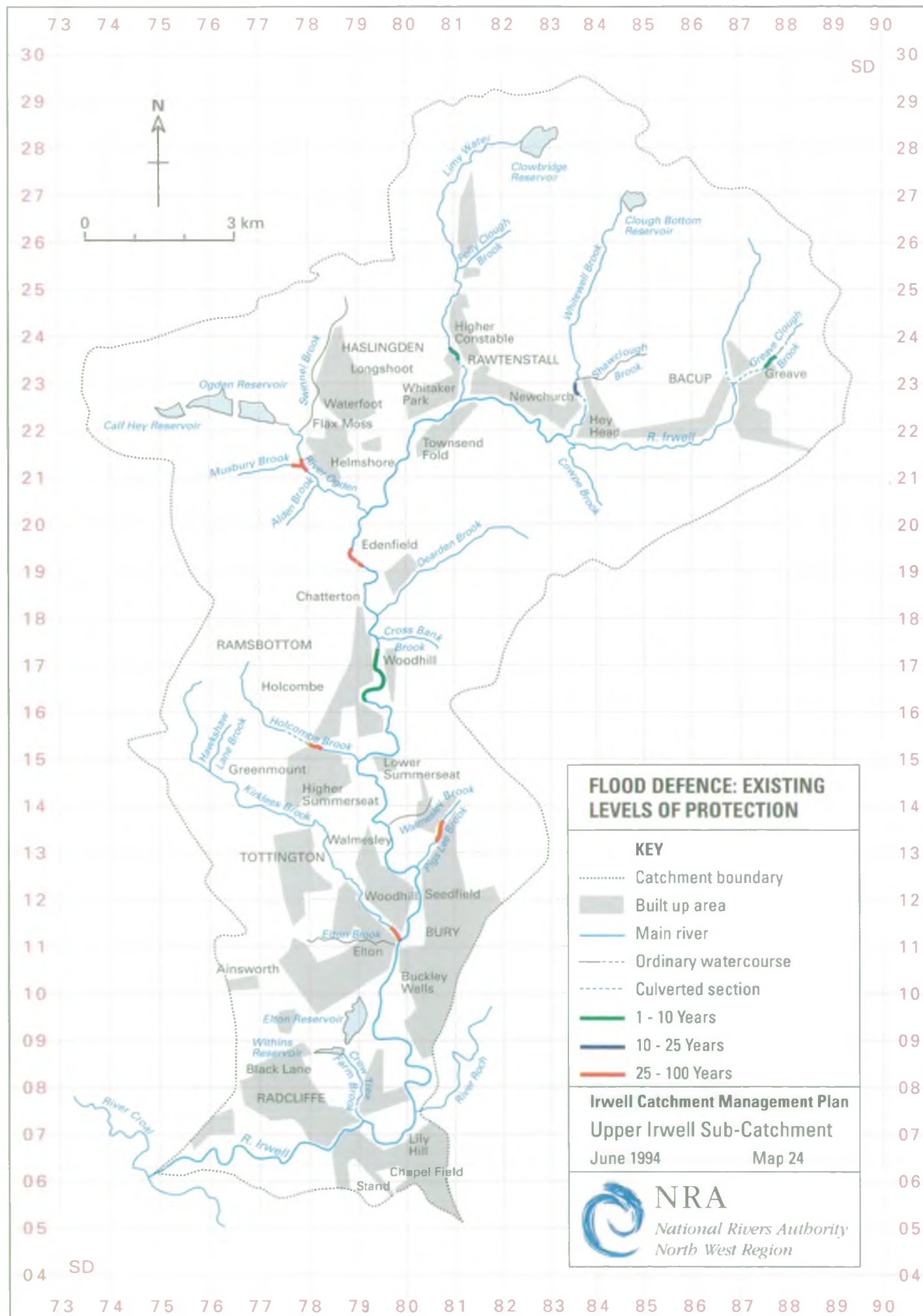
Recreation and Amenity

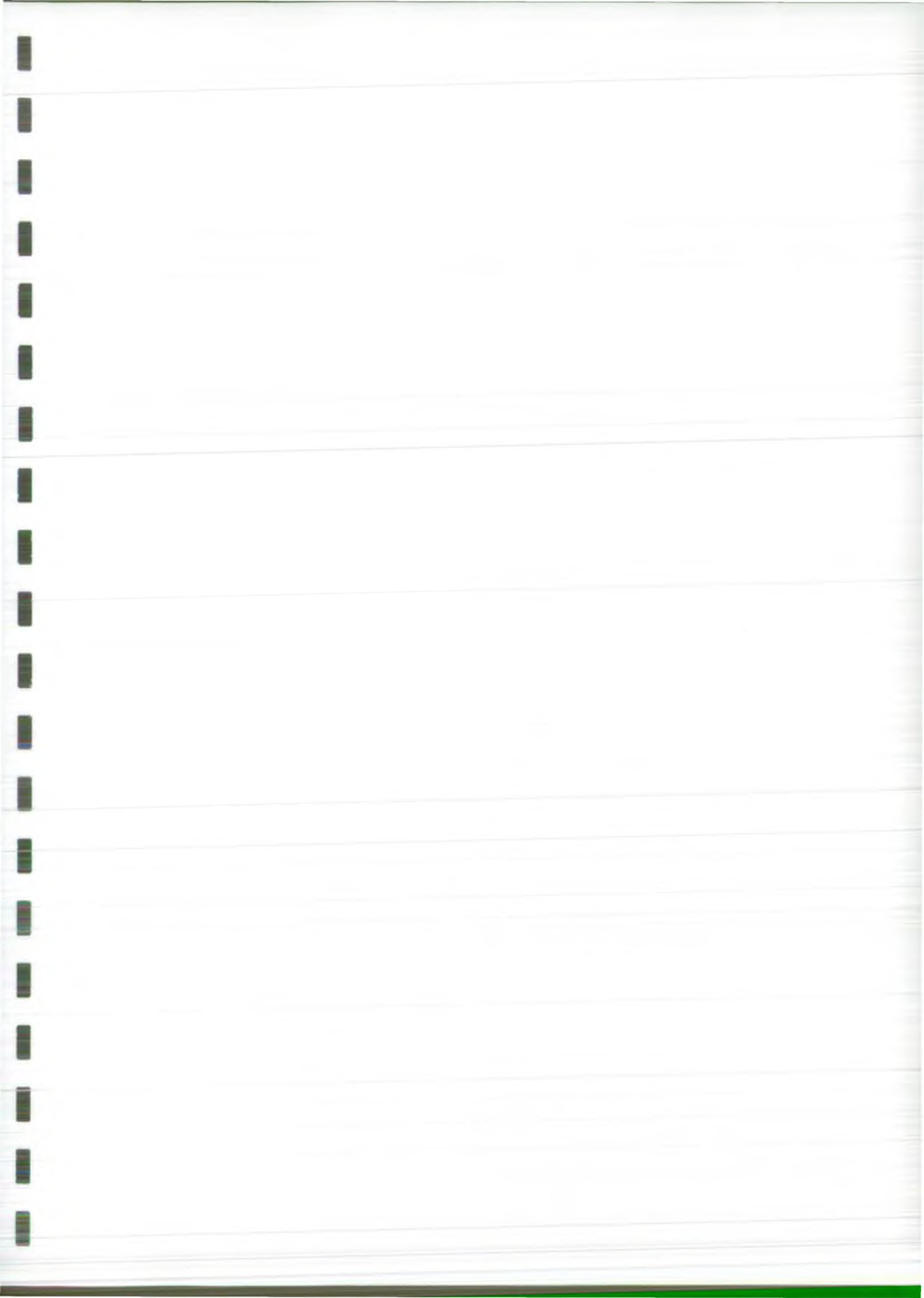
- Promote the potential of open river corridors for informal recreation.
- Promote the creation and linking up of footpaths along and to watercourses.

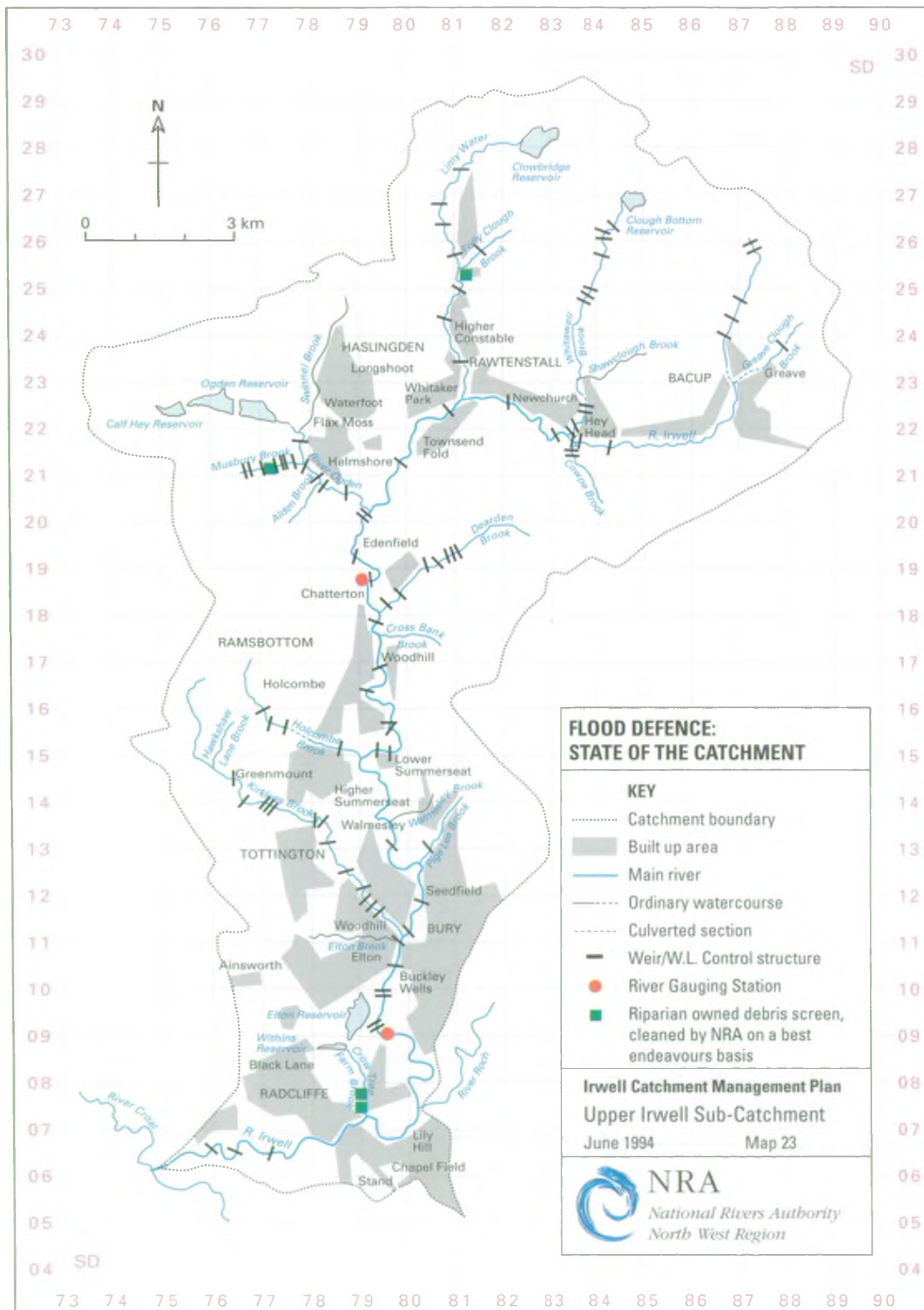
Angling

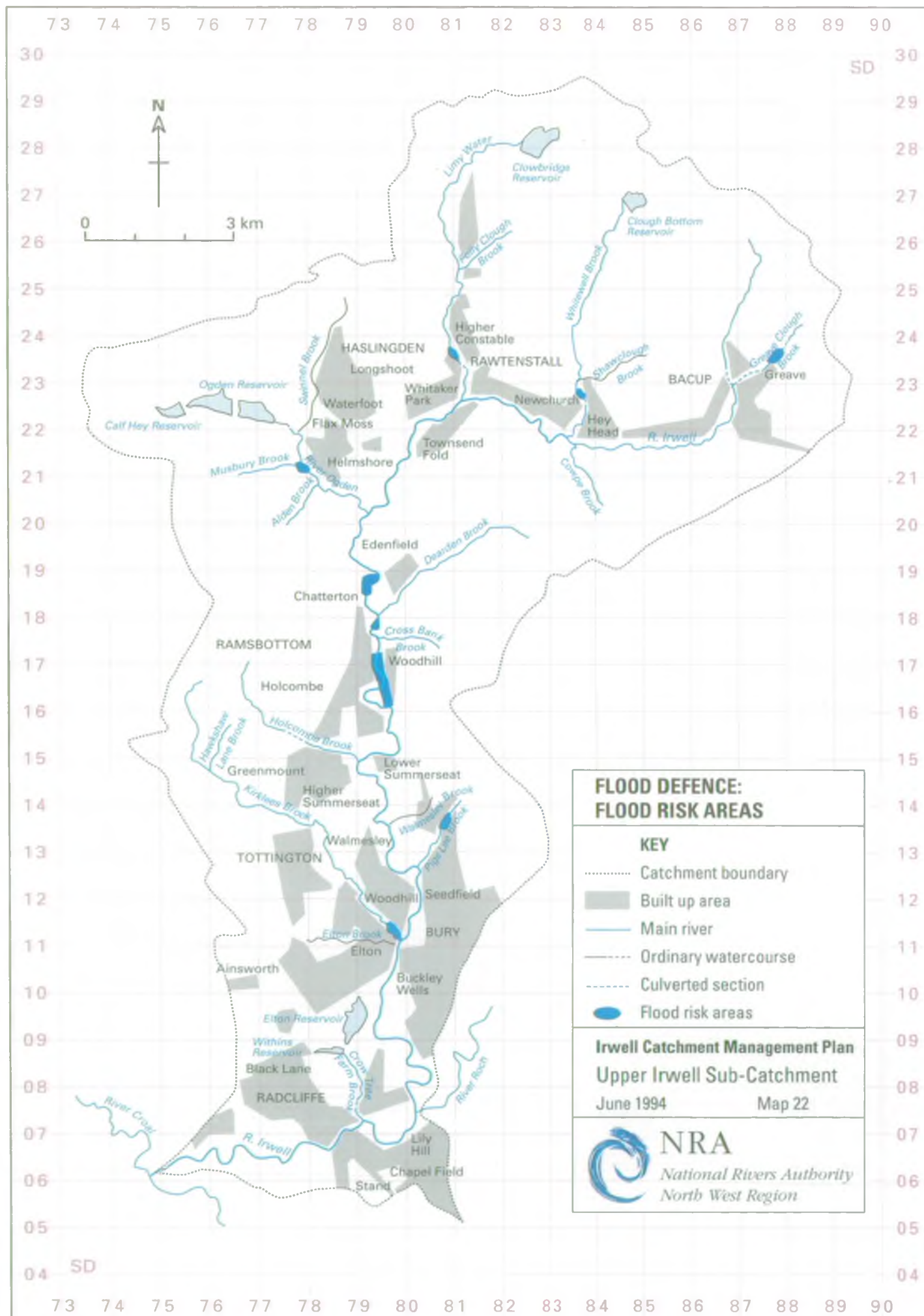
- Endeavour to provide sufficient access and maintain mixture of open water together with instream and drainable habitats.
- Safeguard the variety of still waters in the catchment including the reservoirs, mill lodges and ponds which are also of ecological and historic interest.











4. CURRENT STATE OF CATCHMENT

4.1 STATE OF CATCHMENT : FLOOD DEFENCE (MAPS 22, 23 & 24)

4.1.1 General

A recent review of all known potential flooding problems in the catchment has been undertaken and the results have been used when compiling the Issues and Options section, and producing a map showing Flood Risk Areas. This information is the best available at this time, and no guarantee can be given to its accuracy or completeness, due to insufficient data available. The flood risk areas shown may be larger in extent during more extreme events than those considered, therefore, putting additional property at risk.

Having identified the need for, and standard of, future flood defence works required, it is possible to assess the condition of the existing flood defences within the catchment against these targets.

4.1.2 Issues Identified

a) Catchment Wide Issues

Catchment Wide Issues Nos. 1 - 17 are dealt with in full in Section 4 of Chapter One River Irwell Introduction document.

b) Site Specific Issues

Issue SS2 Greave Clough Brook, Greave, Bacup.

The capacity of the existing culverts and channel is inadequate resulting in a possible flooding risk to housing and industrial units.

Issue SS8 Whitewell Brook, Newchurch

Flood risk to housing, retail and industrial units due to the inadequate capacity of the existing channel and culverts. The possibility of a capital scheme solution is at present being investigated.

Issue SS10 Limy Water, Constable Lee, Rawtenstall

There is a history of flooding in the area which is caused by the inadequate capacity of the existing culverts and channel. A capital scheme to alleviate flooding cannot be justified, therefore, river maintenance and development control is proposed.

Issue SS18 River Irwell, Stubbins (Strongstry)

Properties at risk from flooding due to siltation of channel.

Issue SS19 River Irwell, Stubbins (Strongstry)

Existing gauging station provides poor hydrometric data due to the siltation problems, and there is a proposal for its relocation.

Issue SS22 River Irwell, Ramsbottom

Low lying property in the town is at risk from flooding. A capital scheme is at present being investigated.

Issue SS27 Pigs Lee Brook, Bury

Road only (A56) at risk from flooding should existing culvert block.

Issue SS28 Kirklees Brook, Woodhill

Possible risk of flooding to industrial units should the existing twin culverts block. A scheme has been investigated and there is insufficient justification for a capital scheme to be promoted. Therefore, this area will be subject to river maintenance and development control.

Issue SS29 River Irwell, Bury

Problem of illegal tipping into the river upstream of Bolton Street bridge.

Issue SS32 River Irwell, Bury to Radcliffe

This length of the river has been identified as an ideal reach for removing silt, boulders, etc. before they are washed further downstream towards Salford and Manchester.

Issue SS35 Access Ramps

Access ramps are to be provided at Helmshore and Summerseat on the River Irwell.

4.2 STATE OF THE CATCHMENT : WATER QUANTITY

4.2.1 General

Objectives and targets need to be set in relation to meeting existing and future demand for water abstraction in the catchment for potable water supply, industrial and agricultural uses. In addition targets will be set, where appropriate, for minimum residual river flows and minimum control levels to protect other water uses and users within the catchment.

The present conditions in the catchment are assessed by considering the resource usage and river flow/river level conditions.

The current status of the catchment is then obtained by comparison of present conditions with use-related targets.

4.2.2 Local Hydrometric Network

River Level Recording

In the Upper Irwell sub-catchment there are two river level monitoring stations both on the River Irwell, one at Stubbins, north of Ramsbottom and the other at Bury Bridge in Bury. The records from the Stubbins site, which include both river level and flow, date back to 1974 and are used for water quality management and flood warning by giving prior indication of potentially high water levels further downstream in the Irwell. The river level recording station at Bury Bridge is also used for flood warning purposes and has level records dating back to 1973. No river flows have been recorded at this station. Both these stations are on the Regional Communications system, which enables remote interrogation of the river levels 24 hours a day.

Additional river level monitoring is currently underway for a two year period on Whitewell Brook near Rawtenstall to provide information for the investigation into NRA flood defence investigation project.

Rainfall Monitoring

There are nine raingauges within the Upper Irwell catchment monitored by the NRA of these, two, those at Bacup and Holden Wood are tipping bucket type gauges which give information on rainfall total and intensity. The other seven raingauges record daily totals only.

4.2.3 Issues Identified

a) Catchment Wide Issues

Catchment Wide Issues Nos. 1 - 17 are dealt with in full in Section 4 of Chapter One River Irwell Introduction document.

Issue CW18 Compensation Water Requirements

To carry out a review of compensation water requirements and structures to enforce compliance with statutory requirements and to ensure the best utilisation of resources for various users.

b) Site Specific Issues

Issue SS16 River Ogden, Holden Wood Reservoir.

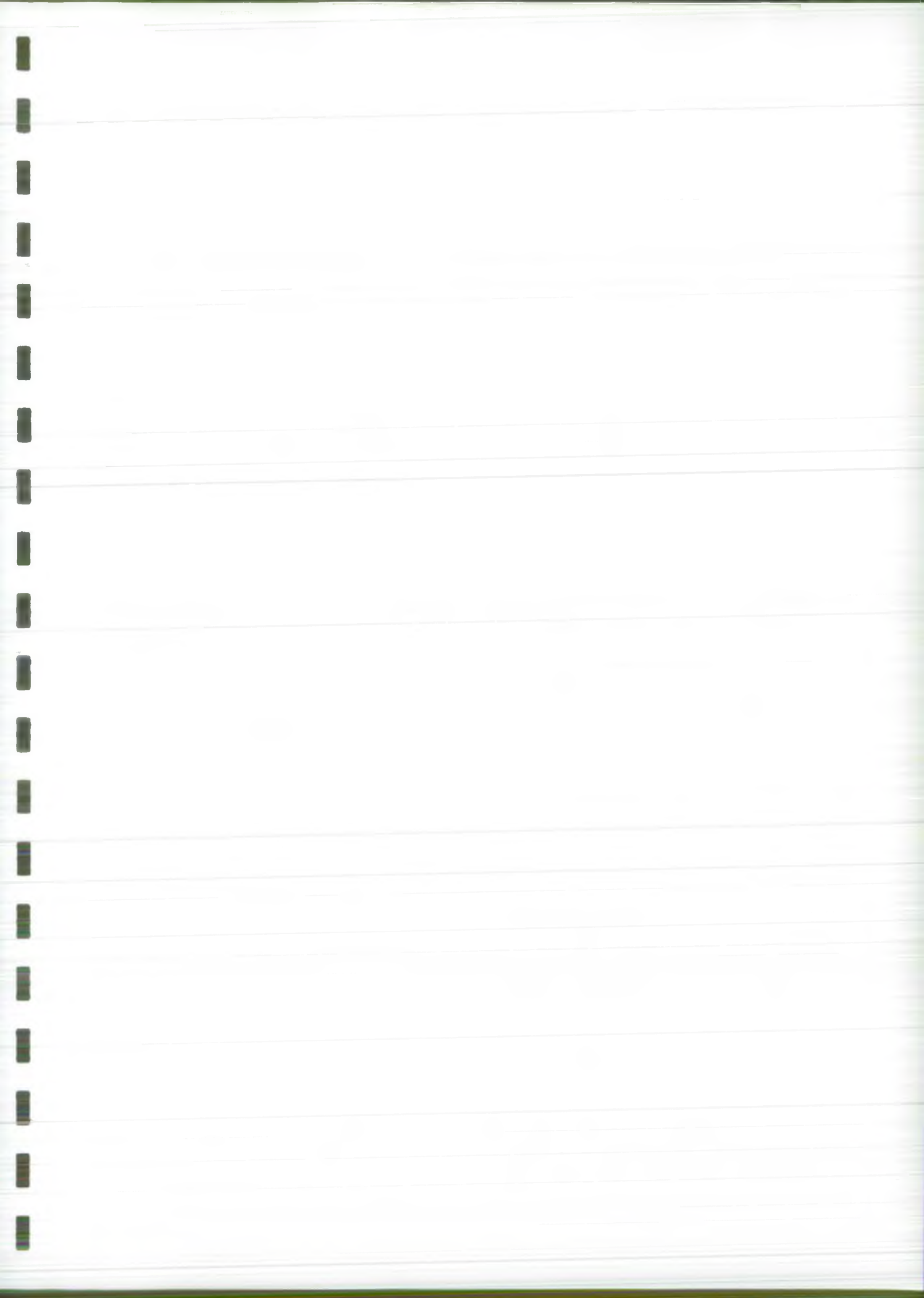
Low flows in River Ogden due to no statutory discharge of compensation water.

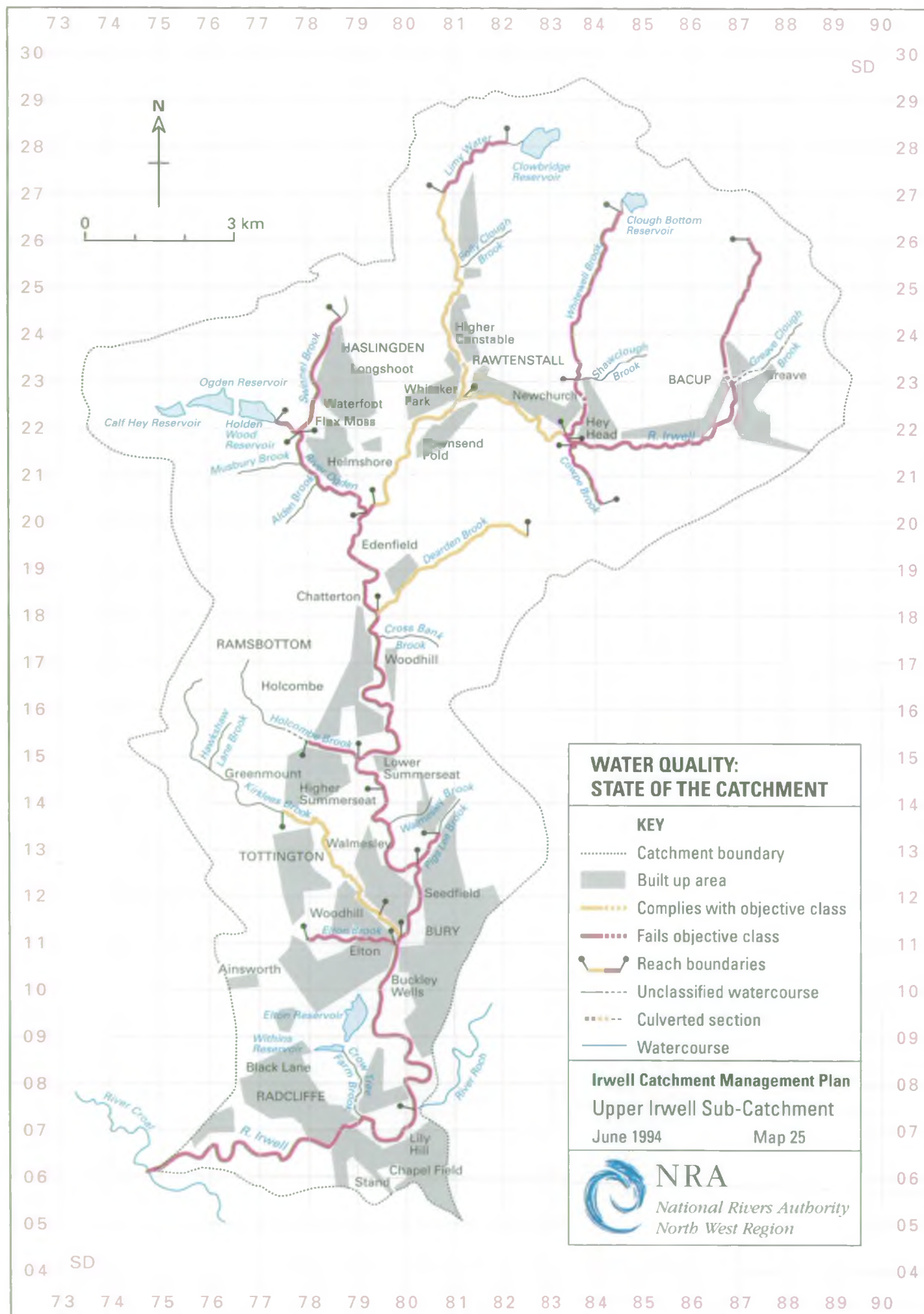
Issue SS19 and SS30 Gauging Stations

Both stations within the Upper Irwell catchment give poor quality data at low flows and investigations are underway to consider moving both stations to improved locations.

Issue SS25 Gin Hall Landfill Site (Closed)

This is an old North West Water disused Service Reservoir site which has been used for landfill purposes. High leachate heads can result in polluting discharges to Walmersley Brook.





4.3 STATE OF THE CATCHMENT : WATER QUALITY (MAP 25)

The routine chemical and biological sampling programme of the NRA is used to assess compliance with the targets set.

4.3.1 Water Quality Classification

a) Present Water Quality Classification Objectives National Water Council (NWC) Classification

This assessment of compliance with the Long Term Objectives is on the basis of the NWC class derived for the calendar year 1993. Of the 19 reaches in the Upper Irwell Catchment 14 fail to meet their Long Term Objectives. This is illustrated on Map 25. The implications in terms of lengths of classified watercourse are tabulated below. The reasons for failure are raised as Issues for this Plan.

CLASS	1993 NWC	LTO
1A	0	8.2
1B	10.2	14.8
2	22.7	52.9
3	43.0	-
4	0	-

Lengths in Km

b) Future Water Quality Classification Objectives Statutory Water Quality Objectives (SWQOs)

No targets set as yet.

4.3.2 EC-Directives

a) Directive on Dangerous Substances in Water

List I

The most recent reports made to the Department of the Environment on compliance with Environmental Quality Standards for List I substances were on data for the calendar year 1993.

No failures of compliance were reported.

List II

The most recent reports made to the Department of the Environment on compliance with Environmental Quality Standards for List II substances were on data for the calendar year 1992.

Data for 1992 for permethrin in the River Irwell downstream of Rossendale STW exceeded the Environmental Quality Standard. This is raised as an Issue for this Plan.

b) Directive on Urban Wastewater Treatment

NRA North West Region undertook an assessment exercise in 1993 of all identified storm and emergency overflows on sewerage networks within the region. Within the Upper Irwell Catchment of the 80 overflows identified over 20 were highlighted as unsatisfactory with regard to their impact on the receiving watercourse. Their effect is raised under several Issues for this Plan.

c) Directive on Water Quality for Freshwater Fish

The most recent reports on compliance made to the Department of the Environment were on the basis of data from the calendar year 1992.

No failures of compliance with Environmental Quality Standards were reported.

d) Directive on Abstraction of Surface Water for Drinking

No reports on compliance have yet been made to the Department of the Environment.

4.3.3 Issues Identified

a) Catchment Wide Issues

Catchment Wide Issues Nos. 1 - 17 are dealt with in full in Section 4 of Chapter One River Irwell Introduction document.

Issue CW19 Widespread aesthetic deterioration due to ochre

Many generally localised stretches of watercourse exhibit a characteristic orange bed discolouration. This arises from iron based solids which can be released in minewater and run-off from other areas of disturbed land, for example, waste tips and spoil tips. It can also occur from natural land drainage.

b) Site Specific Issues

Issue SS1 River Irwell - Source to Cowpe Brook

There is a lack of fishery within the River Irwell from its source, downstream to Cowpe Brook due to poor water quality.

Issue SS3 Cowpe Brook - Higher Boarsgreave to the River Irwell.

This stretch is very significantly affected by run off, from the Kearns of Waterfoot Limited site where there are major problems with the leakage of trade effluent. The trade effluent contains high levels of permethrin which is a moth-proofer used by Kearns.

**Issue SS4 River Irwell - Cowpe Brook to Kirklees Brook
Cowpe Brook - Boarsgreave to the River Irwell.**

The periodic but serious impairment of the invertebrate community in the Upper Irwell Catchment is believed to be a result, at least in part, of the permethrin contamination detailed under SS3 and SS11.

Issue SS5 River Irwell - Deerplay to Whitewell Brook.

This reach is seriously affected by contaminated run-off and mine waters from Old Meadows and Deerplay collieries, which are highly ochreous and acidic in nature. Also there are several CSO's which have a moderate level of impact during periods of wet weather, resulting in organic inputs being discharged to this stretch. Cowpe Brook also affects the lower part of the reach.

Issue SS6 Whitewell Brook - Clough Bottom to Shawclough Brook.

The failure to achieve the present water quality classification objective for this reach has been attributed to the organic input discharged via numerous unsatisfactory sewer overflows. It is also felt that the objective may be unrealistic.

Issue SS7 Whitewell Brook - Shawclough Brook to the River Irwell.

The failure to achieve the present water quality classification objective for this reach has been attributed to the organic input discharged via numerous unsatisfactory sewer overflows. The water flowing into this stretch from upstream is felt to be impacting upon this stretch significantly. It is also felt that the water quality objective may be unrealistic.

Issue SS9 Limy Water - Clow Bridge to Love Clough.

The water quality objective for this stretch is felt to be unrealistic given the surrounding environment.

Issue SS11 River Irwell - Rossendale STW to Chest Wheel Bridge.

The final effluent, and the storm tank discharges from Rossendale STW both have a high impact on the River Irwell within this stretch, with significant levels of permethrin and colour being recorded. It is perceived that the organic load from this same source may also contribute to the failure to achieve the objective.

Issue SS12 River Irwell - downstream of Rossendale STW.

More data needs to be collected to confirm and fully assess the situation. The source of permethrin is in trade effluents persisting through treatment at Rossendale STW.

Issue SS13 River Irwell - downstream of Rossendale STW.

There have been significant reductions in colour levels but the current situation may still be unacceptable. The source of the colour is trade effluents persisting through treatment at Rossendale STW.

Issue SS14 Swinnel Brook - Hud Hey Road to the River Ogden.

Run-off from an industrial estate affect this reach, along with organic loadings being discharged via sewer overflows.

Issue SS15 River Ogden - Holden Wood Reservoir outlet to Swinnel Brook.

Discharges from Bardon Roadstone Limited, Jamestone Quarry have caused water quality problems in the past. In addition water quality is affected by diminished flows in dry weather following the lifting of the compensation water requirements on Holden Wood Reservoir.

Issue SS17 River Ogden - Swinnel Brook to the River Irwell.

The main reason for the failure to meet the water quality objective within this stretch is the input, from Swinnel Brook, with industrial and domestic mis-connections being recorded to the Bridge End Tributary which is a minor tributary feeding into this stretch.

Issue SS20 River Irwell - Chest Wheel Bridge to the River Roch confluence.

Sewage effluent is a significant reason for this stretch not meeting its water quality objective, with discharges from Rossendale STW upstream and Bury STW at the bottom of the stretch generating significant organic loads. As well as the treated and storm effluents from both Rossendale and Bury works there is also a moderate impact upon the water quality experienced as a result of the controlling overflow at Bury works operating during wet weather conditions which causes a deterioration in water quality. There is also an as yet not fully identified influence on the invertebrate fauna.

Issue SS21 River Irwell - Dearden Brook to Holcombe Brook.

The fishery in the River Irwell between Dearden Brook and Holcombe Brook is vulnerable to variability in water quality.

Issue SS23 River Irwell - Holcombe Brook to Kirklees Brook.

There is a poor fishery in the River Irwell between Holcombe Brook and Kirklees Brook due primarily to poor water quality.

Issue SS24 Holcombe Brook - Redisher Close to the River Irwell.

Site drainage from TI Silencers Limited and Carrington Novare Limited, have contributed significantly to the failure of this stretch to meet the objective in the past. There have been recent improvements at both sites.

Site SS26 Pigs Lee Brook - A56 to the River Irwell.

The main reason for the failure of this stretch to meet the water quality objective class has been contaminated site drainage from the Tetrosyl Limited site. There have been improvements recently. Also organic inputs from an unsatisfactory sewer overflows off Walmersley Road impact upon the stretch.

Site SS31 Elton Brook - Dow Lane to the River Irwell.

This stretch is impacted upon by as yet undefined sources entering in culverted sections. There is also an unsatisfactory organic impact caused as a consequence of Curtain Styling Ltd. septic tank currently discharging directly to this stretch.

Site SS33 River Irwell - Kirklees Brook to confluence River Croal.

There is a poor fishery within the River Irwell downstream of Kirklees Brook to its confluence with the River Croal due primarily to poor water quality.

Site SS34 River Irwell - River Roch Confluence to the River Croal Confluence.

The failure to achieve the present water quality objective for this reach has been directly attributable to the organic input discharged via numerous unsatisfactory sewer overflows, in the Radcliffe area and the effect of the upstream River Irwell and River Roch Sub-Catchment. There is a suspicion of impact from Tower Farm Tip Site.

4.4 STATE OF THE CATCHMENT : PHYSICAL FEATURES

4.4.1 General

The industrial history of the area means that long lengths of river have been re-routed, culverted or restrained within walls and behind weirs. Many of the valleys have been developed or tipped, often to the waters edge. There are large numbers of reservoirs, mill lodges and ponds.

A striking range of natural, physical and geomorphological features persist. Substantial sections of river valley remain undeveloped and some areas of flood plain have retained their natural character. Many of the watercourses are actively meandering over a steep stoney bed.

Issues that relate to the physical features of the rivers and associated land have been identified.

4.4.2 Issues Identified

a) Catchment Wide Issues

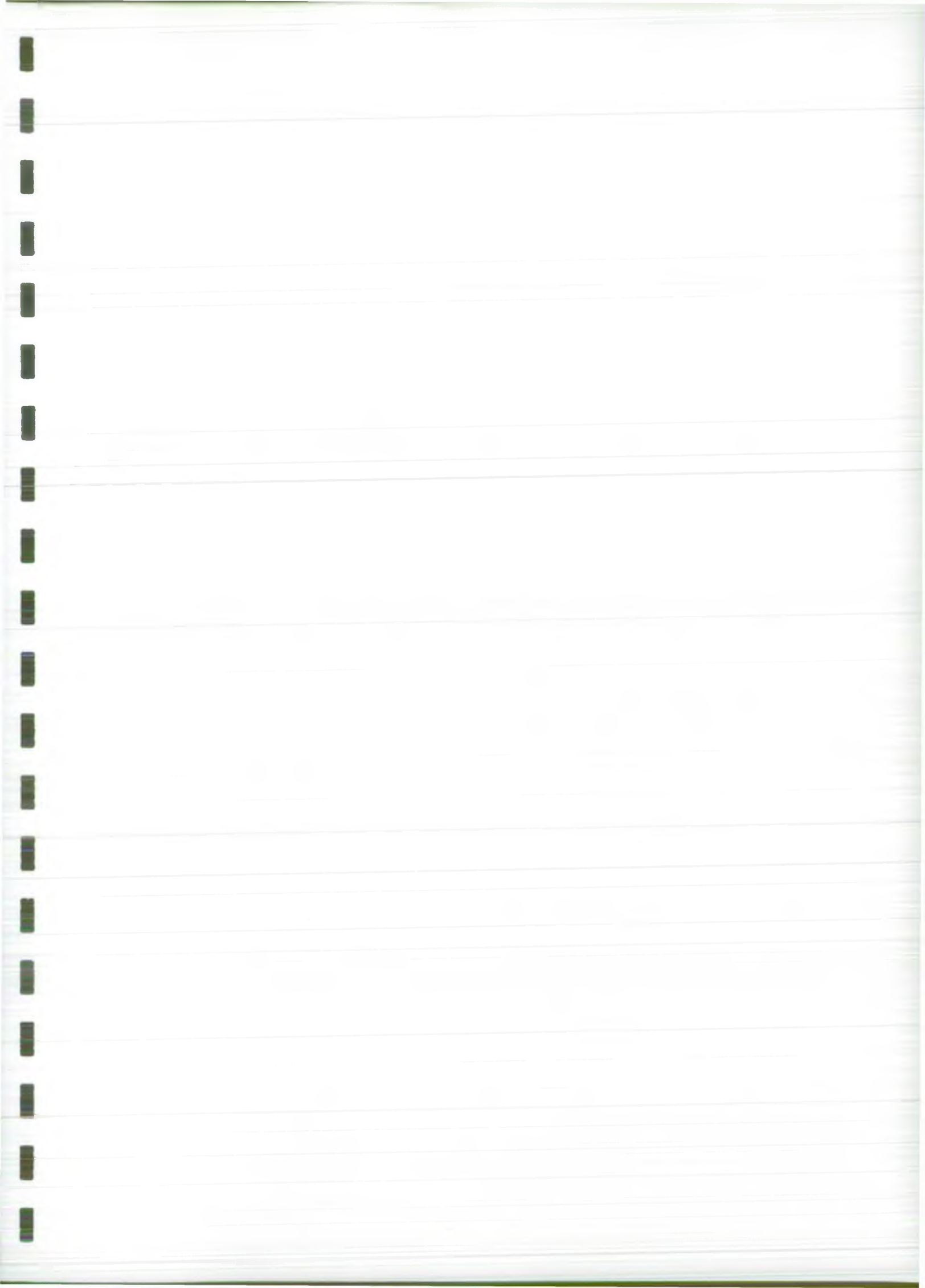
Catchment Wide Issues Nos. 1 - 17 are dealt with in full in Section 4 of Chapter One River Irwell Introduction document.

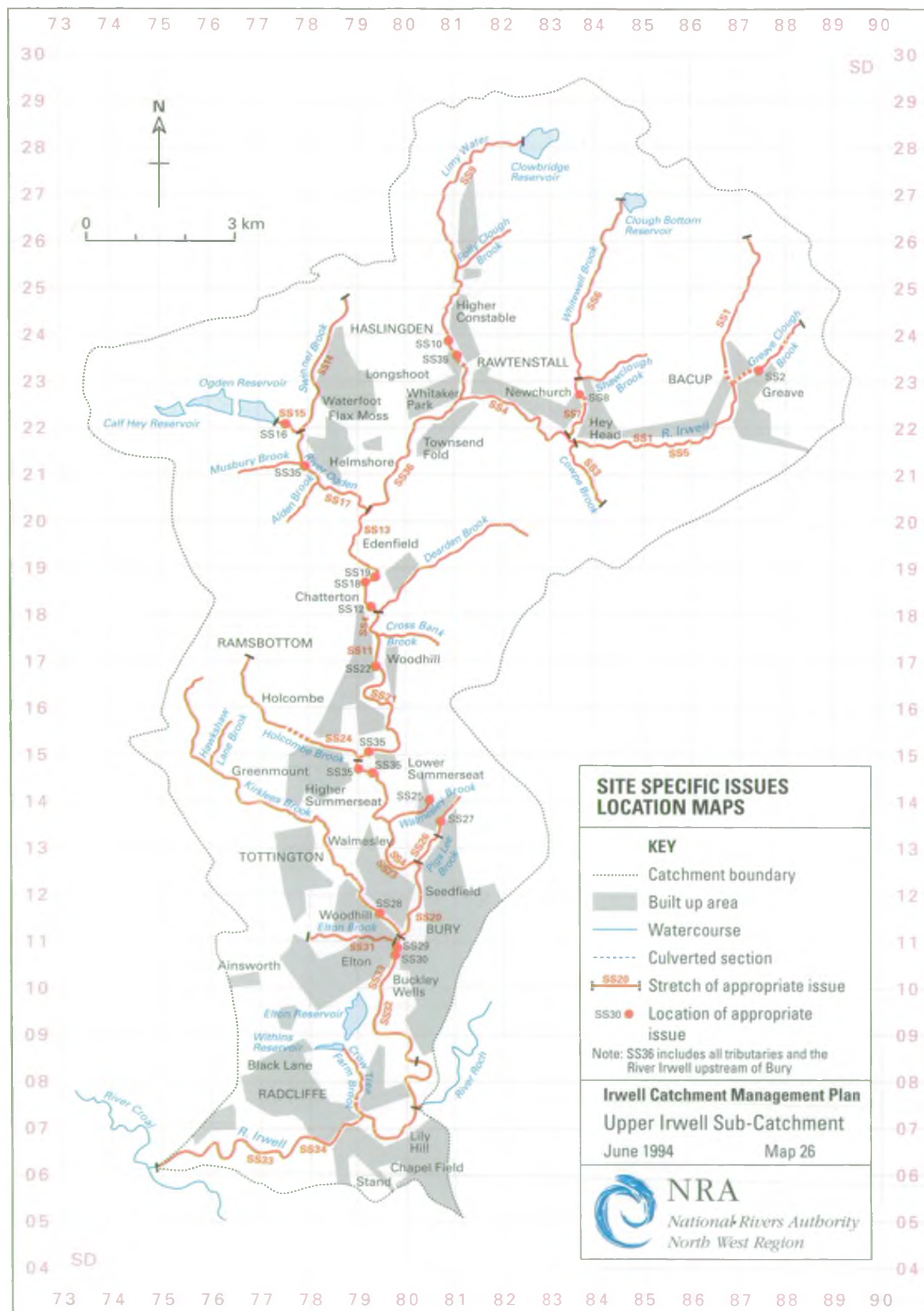
b) Site Specific Issues

Issue SS36 Disjointed countryside management and public access policy on the Irwell upstream of Bury and most tributaries.

Although there is a Croal-Irwell warden service and River Valley Project Committee, the tributaries and the River Irwell upstream of Bury are not included. There is no co-ordinated countryside management and public access policy for the whole sub-catchment to bring together the various interests who are restricted to specific sites, areas or disciplines. There is a need to create interconnected public walkways and linear parks and enable a more informed and strategic response to development proposals.

Footpaths should be sited so as to cause minimum potential disturbance. Some sensitive habitats such as wetlands and steep woodlands should be walked around, rather than through. Moreover a path too close to the bank top may be eroded by the river. Eroding earth banks are vital to species such as sandmartins. A need torevet them would be avoided by siting the footpath further from the bank top.





5. ISSUES AND OPTIONS (MAP 26)

5.1 GENERAL

This section of the plan considers options to address the following issues. The options as presented are the initial thoughts of the North West Region of the NRA and do not constitute policy statements. Comments on the issues and options are invited together with any new ideas/suggestions. They should be considered together with the Catchment Wide Issues 1 - 17 for the River Irwell catchment in Chapter One (Section 4) River Irwell Introduction document.

Wherever possible the body responsible for carrying out each option has been identified. In some cases this is identified as someone other than the NRA. However, the options as presented are intended as a plan to facilitate improvements to the water environment for the benefit of all users. Obviously this will entail many bodies and individuals working together to fulfil the aims and objectives as detailed in this Catchment Management Plan.

5.2 CATCHMENT WIDE ISSUES

Catchment Wide Issues 1 - 17 for the River Irwell Catchment are dealt with in Chapter One River Irwell Introduction document (Section 4). There are two additional catchment wide issues which relate specifically to the Upper Irwell Sub-Catchment.

ISSUE NO: CW18		Compensation water requirements and in-river structures require review.	
OPTIONS	Responsibility	Advantages	Disadvantages
1. Increase or decrease compensation water as necessary	NRA/NWW Ltd.	<p>Benefits to amenity, recreation and angling at reservoirs if compensation water decreased.</p> <p>Benefits to downstream river environment and users if compensation water increased.</p>	<p>Reduced flows for effluent dilution, fisheries and downstream river environment.</p> <p>Possible increased operating costs and supply problems for water undertaker.</p>

ISSUE NO: CW19		Widespread aesthetic deterioration in the Catchment due to ochre.	
OPTIONS	Responsibility	Advantages	Disadvantages
1. Reduction in impact of ochreous run-off from spoil tips, waste tips and apparently natural sources.	NRA to pursue means of run-off control or site/ watercourse treatment.	Improvement to aesthetic and amenity value.	Difficult to establish liability/ funding with high risk of failure.

5.3 SITE SPECIFIC ISSUES (MAP 26)

ISSUE NO: SS1	River Irwell - Source to Cowpe Brook Lack of fishery due primarily to poor water quality.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Stocking of appropriate fish species as and when prevailing WQ allows and the monitoring of fish population.	NRA	Development of Fisheries	Possible loss of fish stocks due to intermittent sporadic pollution.
2. Natural colonisation and monitoring.		Less Cost.	Extended timescale because of the river having very few fish in its upper reaches.

ISSUE NO: SS2	Greave Clough Brook, Greave Risk of flooding to industrial units and approx. 27 houses.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Replace existing culvert with new culvert of adequate size. Increase level of existing defences.	NRA/Riparian Owner	Improves existing level of flood protection.	Scheme cost. Major disruption to business.
2. Improve existing culvert capacity.	NRA/Riparian Owner	Improves existing level of flood protection.	Scheme cost.

ISSUE NO: SS3	Cowpe Brook - Higher Boarsgreave to the River Irwell. Failure to achieve the present water quality classification objective for the classified reach.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Elimination of the loss of permethrin from the Kearns of Waterfoot Ltd. site.	NRA to continue enforcement action. Kearns of Waterfoot Ltd to continue remedial works to eliminate loss.	Achievement of present water quality classification objective.	Cost to Kearns of Waterfoot Ltd. and possibly customers.

Achievement of the present water quality classification objective for Cowpe Brook has additional benefits for the downstream reach of the River Irwell. The relevant reach of the River Irwell is considered under Issue SS5.

ISSUE NO: SS4	(a) River Irwell - Cowpe Brook to Kirklees Brook. (b) Cowpe Brook - Boarsgreave to the River Irwell Aquatic invertebrate community severely impaired.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Improvement in water quality.	NRA/NWW Site Owners.	Improvement of aquatic ecosystem.	Cost

ISSUE NO: SS5	River Irwell - Deerplay to Whitewell Brook Failure to achieve the present water quality classification objective for the classified reach.		
OPTIONS	Responsibility	Advantages	Disadvantages
<p>Combination of the following:</p> <p>1. Reduction in the impact of ochreous discharges from previous mining operations at Old Meadows and Deerplay.</p> <p>2. Reduction in organic and debris load from unsatisfactory sewer overflows.</p>	<p>NRA to pursue means of run-off control or site/watercourse treatment.</p> <p>As a requirement of the EC Urban Wastewater Treatment Directive.</p> <p>NRA/NWW Ltd to agree improvements required to achieve satisfactory performance.</p> <p>NWW Ltd to undertake capital works.</p>	<p>Achievement of present water quality classification objective.</p> <p>Improvement to the aesthetic and amenity value and fishery potential.</p> <p>Achievement of the present water quality classification objective.</p> <p>Improvement to the aesthetic and amenity value and fishery potential.</p>	<p>Difficulties in establishing liability/funding.</p> <p>Cost to NWW Ltd and possibly customers.</p>

EC - European Community

Achievement of the present water quality classification objective will also require improvements in the quality of Cowpe Brook flowing into this reach. Cowpe Brook is dealt with under Issue SS3.

ISSUE NO: SS6	Whitewell Brook - Clough Bottom to Shawclough Brook. Failure to achieve the present water quality classification objective for the classified reach.		
OPTIONS	Responsibility	Advantages	Disadvantages
<p>1. Reduction in organic and debris load from unsatisfactory sewer overflows.</p> <p>Possibly in conjunction with</p> <p>2. Revision of present water quality classification objective from 1A to 1B (the watercourse is currently classified as Class 2)</p>	<p>As a requirement of the EC Urban Wastewater Treatment Directive.</p> <p>NRA/NWW Ltd to agree improvements required to achieve satisfactory performance.</p> <p>NWW Ltd to undertake capital works.</p> <p>NRA</p>	<p>Contribution to achievement of present water quality classification objective.</p> <p>Improvement to aesthetic and amenity value and fishery potential.</p> <p>Prevention of expenditure on remedial measures on sources such as urban run-off normally outside the scope of pollution control.</p>	<p>Cost to NWW Ltd and possibly customers.</p> <p>Apparent relaxation of water quality standards.</p>

EC - European Community

Achievement of the present water quality classification objective has additional advantages for the downstream reach of Whitewell Brook. This is considered under Issue SS7.

ISSUE NO: SS7	Whitewell Brook - Shawclough Brook to the River Irwell. Failure to achieve the present water quality classification objective for the classified reach.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Reduction in the organic and debris load from unsatisfactory sewer overflows.	As a requirement of the EC Urban Wastewater Treatment Directive. NRA/NWW Ltd to agree improvements required to achieve satisfactory performance. NWW Ltd to undertake capital works.	Contribution to the achievement of the present water quality classification objective. Improvement to the aesthetic and amenity value and fishery potential.	Cost to NWW Ltd and possibly, customers.
The quality of water flowing into the reach from upstream also has a significant influence. The upstream reach is dealt with under Issue SS6. However, if improvements were made under both sources the reach may still not achieve the classification objective due to sources, such as urban run-off, normally outside the scope of pollution control. As such there is a further option:			
2. Revision of the present water quality classification objective from Class 1A to Class 1B. (The watercourse is currently classified as Class 2)	NRA	Prevention of expenditure on pollution sources such as urban run-off normally considered outside the scope of pollution control.	Apparent relaxation of water quality standards.

EC - European Community

ISSUE NO: SS8		Whitewell Brook, Newchurch	
		Flooding to 13 houses, 10 retail and industrial units.	
OPTIONS	Responsibility	Advantages	Disadvantages
1. Improve channel capacity by raising existing defences.	NRA	Improves existing level of flood protection.	Scheme cost. Some visual and environmental impact.
2. Replace access bridges.	NRA/Highway Authority/ Riparian Owner.	Improves existing level of flood protection.	Scheme cost. Bridge structure may be of architectural and historic value.
3. Regrade channel to lower bed level.	NRA	Improves existing level of flood protection.	Disruption to natural bed. Scheme cost and possibly maintenance costs.

ISSUE NO: SS9		Limy Water - Clow Bridge to Love Clough.	
		Failure to achieve the present water quality classification objective for the classified reach.	
OPTIONS	Responsibility	Advantages	Disadvantages
1. Revision of the present water quality classification objective from 1A to 1B (the watercourse is currently classified as 1B)	NRA	Prevention of expenditure on remedial measures on pollution sources normally considered outside the scope of pollution control.	Apparent relaxation of water quality standards.

ISSUE NO: SS10	Limy Water, Constable Lee, Rawtenstall. Flooding to 40 houses and road.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Replace culverts and increase height of flood defences.	NRA/Highway Authority	Improves existing level of flood protection.	Scheme cost may exceed benefits. Some visual and environmental impact.
2. Maintenance of existing culverts and apply development control policy.	NRA/Developers/ Local Authority	Maintains existing level of flood protection.	Maintenance costs. Increased development costs.

ISSUE NO: SS11	River Irwell - Rossendale STW to Chest Wheel Bridge Failure to achieve the present water quality classification objective for the classified reach.		
OPTIONS	Responsibility	Advantages	Disadvantages
<p>Combination of the following:</p> <p>1. Reduction in permethrin load from Rossendale STW.</p> <p>2. Evaluation of requirement for reduction in organic load from Rossendale STW and reduction as appropriate.</p>	<p>NRA to monitor water quality and enforce reduction.</p> <p>NWW Ltd to pursue control of trade effluent permethrin load from Kearns of Waterfoot Ltd. or provide treatment at STW.</p> <p>NRA to undertake evaluation and promote within other regulatory influences capital expenditure by NWW Ltd if required.</p> <p>NWW Ltd to undertake capital works if required.</p>	<p>Achievement of present water quality classification objective.</p> <p>Achievement of present water quality classification objective. Improvement to aesthetic and amenity value and fishery potential.</p>	<p>Cost to NWW Ltd and/or Kearns of Waterfoot Ltd. and possibly customers.</p> <p>Possible cost to NWW Ltd and customers.</p>

STW - Sewage Treatment Works

Contribution to achievement of the present water quality classification objective by Option 1 has additional advantages in compliance with the EC List II Dangerous Substances Environmental Quality Standard for permethrin as considered under Issue SS12.

ISSUE NO: SS12	River Irwell - downstream of Rossendale STW Indications of exceedences of the Environmental Quality Standard for an E.C. List II Dangerous Substance (Permethrin)		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Collection of more data with analysis to the appropriate limit of detection in order to fully assess the exceedence. 2. Reduction in the permethrin load from Rossendale STW.	NRA NRA to enforce reduction. NWW Ltd to pursue control of trade effluent permethrin load from Kearns of Waterfoot Ltd. or provide treatment at STW.	Full understanding and demonstration of the exceedence. Compliance with Environmental Quality Standard.	Cost to NWW Ltd and/or Kearns of Waterfoot Ltd. and possibly customers.

EC - European Community
 STW - Sewage Treatment Works

Compliance with the EC List II Dangerous Substances Environmental Quality Standard has additional advantage for achievement of the present water quality classification objective for the classified reach of the River Irwell downstream of Rossendale STW. The relevant reach is considered under Issue SS11.

ISSUE NO: SS13	River Irwell - downstream of Rossendale STW Aesthetic deterioration due to colour.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Re-evaluation of colour following reductions in colour load from Rossendale STW and possible further reductions.	NRA to monitor and assess colour and promote reductions in load as appropriate. NWW Ltd to achieve colour reductions as appropriate.	Possible further improvement in aesthetic value.	Cost to NWW Ltd/ trade effluent dischargers and possibly customers.

STW - Sewage Treatment Works

ISSUE NO: SS14	Swinnel Brook - Hud Hey Road to the River Ogden. Failure to achieve the present water quality classification objective for the classified reach.		
OPTIONS	Responsibility	Advantages	Disadvantages
<p>Combination of the following:</p> <ol style="list-style-type: none"> 1. Reduction in organic and debris load from unsatisfactory sewer overflows. 2. Continued control of contamination of drainage from Carrs Industrial Estate. 	<p>As a requirement of the EC Urban Wastewater Treatment Directive.</p> <p>NRA/NWW Ltd to agree improvements required to achieve satisfactory performance.</p> <p>NWW Ltd to undertake capital works</p> <p>NRA to continue to monitor water quality, undertake inspections and pursue site improvements.</p> <p>Site owners to undertake remedial measures as appropriate.</p>	<p>Achievement of the present water quality classification objective.</p> <p>Improvement to the aesthetic and amenity value and fishery potential.</p> <p>Achievement of the present water quality classification objective.</p> <p>Improvement to the aesthetic and amenity value and fishery potential.</p>	<p>Cost to NWW Ltd and possibly customers.</p> <p>Cost to site owners.</p>

EC - European Community

Achievement of the present water quality classification objective for Swinnel Brook has additional benefits for the River Ogden. The relevant reach of the River Ogden is considered under Issue SS17.

ISSUE NO: SS15		River Ogden - Holden Wood Reservoir Outlet to Swinnel Brook	
		Failure to achieve the present water quality classification objective for the classified reach.	
OPTIONS	Responsibility	Advantages	Disadvantages
1. Sustained improvement in the quality of the Bardon Roadstone Ltd. Jamestone Quarry discharge.	NRA to continue to monitor water quality and enforce current consent conditions. Bardon Roadstone Ltd. to continue improved management of site drainage and treatment.	Possible achievement of present water quality classification objective and improvement to fishery potential. Improvement to aesthetic and amenity value.	Possible cost to Bardon Roadstone Ltd.
2. Investigation of the impact of lower flows following the lifting of the requirement for compensation water from Holden Wood Reservoir.	NRA	Fuller understanding of the failure to achieve the present water quality classification objective.	

ISSUE NO: SS16		River Ogden - Holden Wood Reservoir	
		No obligation to discharge compensation water from Holden Wood Reservoir.	
OPTIONS	Responsibility	Advantages	Disadvantages
1. Negotiate compensation flows.	NRA/NWW	Maintenance of flow during dry weather to maintain fishery and protect ecology of River Ogden. Possible achievement of present water quality classification objective.	Cost.

ISSUE NO: SS17	River Ogden - Swinnel Brook to the River Irwell. Failure to achieve the present water quality classification objective for the classified reach.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Elimination of domestic and industrial wrong connections to the Bridge End Tributary.	NRA to pursue investigation/enforcement work. NWW Ltd/Borough of Rossendale to undertake investigation/enforcement work. NWW Ltd/ industrial unit owners/ householders to undertake remedial works.	Achievement of present water quality classification objective. Improvement to the aesthetic and amenity value and fishery potential.	Cost to NWW Ltd/ Borough of Rossendale Council Cost to NWW Ltd/ industrial unit owners/ householders.

Achievement of the present water quality classification objective will also require improvements in the quality of Swinnel Brook flowing into this reach. Swinnel Brook is dealt with under Issue SS14.

ISSUE NO: SS18	River Irwell - Stubbins (Strongstry) Risk of flooding to houses and road due to river siltation.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Remove shoaled material when necessary.	NRA	Maintains existing level of flood protection	Maintenance cost and disturbance to natural river bed.

ISSUE NO: SS19	River Irwell - Stubbins (Strongstry) Existing gauging station provides poor hydrometric data.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Re-locate gauging station.	NRA	Accurate hydrometric data provided. Improved information for flood warning. Improved data useful to all NRA functions and outside customers.	Scheme cost. Visual impact Loss of historic data-set. Requires Rights of Access.

ISSUE NO: SS20	River Irwell - Chest Wheel Bridge to the River Roch Confluence Failure to achieve the present water quality classification objective for the classified reach.		
OPTIONS	Responsibility	Advantages	Disadvantages
Combination of the following: 1. Reduction in the impact of an, as yet, not fully identified influence on the benthic fauna. 2. Reduction in the organic load from Bury STW.	NRA to undertake investigations into the source and pursue appropriate remedial measures.	Achievement of the present water quality classification objective.	Cost to liable parties.
	NRA to review consent conditions and promote within other regulatory influences capital expenditure by NWW Ltd. NWW Ltd to undertake capital works.	Improvement to the fishery potential. Achievement of the present water quality classification objective. Improvement to the aesthetic and amenity value and fishery potential.	Cost to NWW Ltd and possibly customers.

STW - Sewage Treatment Works

Achieving the present water quality classification objective for this reach has additional benefits for the downstream classified reach of the River Irwell. The downstream reach is considered in Issue SS34.

ISSUE NO: SS21	River Irwell - Dearden Brook to Holcombe Brook Vulnerable fishery due primarily to poor water quality.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Stocking of appropriate fish species as and when prevailing WQ allows and the monitoring of fish population.	NRA	Development of Fisheries.	Possible loss of stocks to intermittent or sporadic pollutions.
2. Natural colonisation and monitoring.		Less Cost	Extended timescale because of the river having few fish in its upper reaches.

WQ - Water Quality

ISSUE NO: SS22	River Irwell, Ramsbottom Flooding to 10 houses and industrial units (5000 m²).		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Improve channel capacity by raising existing defences.	NRA	Increase existing level of flood protection.	Scheme cost. Some visual and environmental impact.
2. Modify existing weir.		Increase existing level of flood protection.	Scheme cost. Effects on river regime upstream unknown.

ISSUE NO: SS23	River Irwell - Holcombe Brook to Kirklees Brook. Poor of fishery due primarily to poor water quality.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Stocking of appropriate fish species as and when prevailing WQ allows and the monitoring of fish population.	NRA	Development of Fisheries.	Possible loss of stocks to intermittent or sporadic pollutions.
2. Natural colonisation and monitoring.		Less cost	Extended timescale because of the river having few fish in its upper reaches.

WQ - Water Quality

ISSUE NO: SS24	Holcombe Brook - Redisher Close to the River Irwell. Failure to achieve the present water quality classification objective for the classified reach.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Sustained improvements in the quality of site drainage from TI Silencers Ltd and Carrington Novare Ltd.	NRA to continue to monitor water quality and pursue further improvements as required. TI Silencers Ltd. and Carrington Novare Ltd. to undertake further improvements as required.	Achievement of the present water quality classification objective. Improvement to the aesthetic and amenity value and fishing potential.	Possible cost to TI Silencers Ltd and Carrington Novare Ltd.

ISSUE NO: SS25	Gin Hall Landfill Site (Closed) Leachate discharge to Walmersley Brook.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Stop discharge.	NRA/ Environmental Health/Site Owner	Improves the river environment.	Costs.

ISSUE NO: SS26	Pigs Lee Brook - A56 to the River Irwell. Failure to achieve the present water quality classification objective for the classified reach.		
OPTIONS	Responsibility	Advantages	Disadvantages
Combination of the following: 1. Sustained and further improvement in the quality of the site drainage discharge from the Tetrosyl Ltd. site.	NRA to continue to monitor water quality. HMIP to undertake necessary enforcement action.	Achievement of the present water quality classification objective. Improvement to the aesthetic and amenity value and fishery potential.	
2. Reduction in the organic load from the unsatisfactory sewer overflow off Walmersley Road.	Tetrosyl Ltd. to sustain current, and undertake further, improvements in site management and drainage. As a requirement of the EC Urban Wastewater Treatment Directive. NRA/NWW Ltd to agree the improvements required to achieve satisfactory performance.		Cost to Tetrosyl Ltd.
	NWW Ltd to undertake capital works.		Cost to NWW Ltd and possibly customers.

EC - European Community
 HMIP - Her Majesty's Inspectorate of Pollution

ISSUE NO: SS27	Pigs Lee Brook, Bury Risk of flooding to A56 if culvert blocks.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Replace existing culvert with new culvert of adequate size.	NRA/Highway Authority	Improves level of flood protection of culvert.	Scheme Cost.
2. Install debris screens	NRA/Highway Authority	Maintains existing level of protection for less works cost.	Scheme cost. Greater maintenance cost and continued risk of flooding.
3. Do nothing	Highway Authority	No costs	Risk of flooding continues, any blockage could only be cleared once flooding subsides.

ISSUE NO: SS28	Kirklees Brook, Woodhill Flooding to industrial units caused by silting of two culverts.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Maintain culvert. Apply development control policy.	NRA	Improves existing level of flood protection. No works cost.	Maintenance cost.

ISSUE NO: SS29	River Irwell, Bury Tipping problem upstream of Bolton Street bridge.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Continued action by enforcement officer re problems caused by tipping	NRA	Reduces risk of flooding by rubbish and other waterborne debris. Improves visual appearance of river.	

ISSUE NO: SS30	River Irwell - Bury Bridge Existing gauging station provides poor hydrometric data.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Re-locate gauging station.	NRA	Accurate hydrometric data provided. Improved information for flood warning. Improved data useful to all NRA functions and outside customers.	Visual impact Loss of historic data set. Requires Rights of Access.

ISSUE NO: SS31	Elton Brook - Dow Lane to the River Irwell. Failure to achieve the present water quality classification objective for the classified reach.		
OPTIONS	Responsibility	Advantages	Disadvantages
<p>Combination of the following:</p> <p>1. Reduction in organic load from as yet not fully defined sources entering in the culverted section.</p> <p>2. Elimination of the organic load from Curtain Styling Ltd. septic tank.</p>	<p>NRA to pursue investigation.</p> <p>NRA/liable parties to undertake investigations.</p> <p>Liable parties to undertake remedial measures as required.</p> <p>NRA/ Metropolitan Borough of Bury Environmental Health Department to enforce elimination of unsatisfactory discharge.</p>	<p>Achievement of the present water quality classification objective.</p> <p>Improvement to the aesthetic and amenity value and fishery potential.</p> <p>Achievement of present water quality classification objective.</p> <p>Improvement to the aesthetic and amenity value and fishery potential.</p>	<p>Cost to liable parties.</p> <p>Cost to liable parties.</p> <p>Cost to Curtain Styling Ltd./householders of connected properties.</p>

ISSUE NO: SS32	River Irwell - Bury to Radcliffe Large amounts of material deposited in river bed.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Removal of material at frequent intervals.	NRA	Material prevented from increasing flood risk downstream in Salford and Manchester.	Costs of material removal and provision of access. Disruption to natural bed.
2. Do nothing		Least cost.	Possible increase in flood risk to properties downstream in Salford and Manchester. Loss of in channel habitat diversity.

ISSUE NO: SS33	River Irwell - Kirklees Brook to confluence River Croal. Poor fishery due primarily to poor water quality.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Stocking of appropriate fish species as and when prevailing WQ allows and the monitoring of fish population.	NRA	Development of Fisheries.	Possible loss of stocks to intermittent or sporadic pollutions.
2. Natural colonisation and monitoring.		Less Cost	Extended timescale because of the river having few fish in its upper reaches.

ISSUE NO: SS34	River Irwell - River Roch confluence to the River Croal confluence Failure to achieve the present water quality classification objective for the classified reach.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Reduction in the organic and debris load from unsatisfactory sewer overflows in Radcliffe.	As a requirement of the EC Urban Wastewater Treatment Directive.	Achievement of the present water quality classification objective.	Cost to NWW Ltd and possibly customers.
2. Evaluation of the possible pollution impact of Tower Farm Tip site.	NRA/NWW Ltd to agree improvements required to achieve satisfactory performance.	Improvement to the aesthetic and amenity value and fishery potential.	
	NWW Ltd to undertake capital works. NRA to undertake investigations.	Fuller understanding of possible contributory factor.	

EC - European Community

Achievement of the present water quality classification objective will also require improvements in the Roch sub-catchment and upstream reach of the River Irwell. The River Roch sub-catchment is considered in Chapter 3. The upstream reach is dealt with under Issue SS20 of this chapter.

ISSUE NO: SS35	Access Ramps. Scheme for the provision of 'Urban Channel Access Ramps' at Helmshore, Summerseat and Rawtenstall.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Locations have been identified for the provision of access ramps.	NRA	Reduced cost of maintenance due to improved access.	Scheme costs.

ISSUE NO: SS36	Disjointed countryside management and public access policy particularly on the Irwell upstream of Bury and most tributaries.		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Co-ordinate the creation of a comprehensive policy for the whole sub catchment.	NRA Rossendale DC, Bury & Salford MBC's	Improve recreational and wildlife value of river corridors.	Resource implications.
	Rights of Way Officers, Countryside Management services, Groundwork Trust, Croal Irwell Valley Project Committee.	More strategic and informed development control.	

DC - District Council
MBC - Metropolitan Borough Council

National Rivers Authority North West Region

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