NRA NORTH WEST 57

MERSEY SUB-CATCHMENT REPORT

ENVIRONMENT AGENCY

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National Rivers Authority
North West Region
February 1996

DAVID CORBERLL

Upper Mersey Catchment Management Plan River Mersey Sub-Catchment

ENVIRONMENT AGENCY
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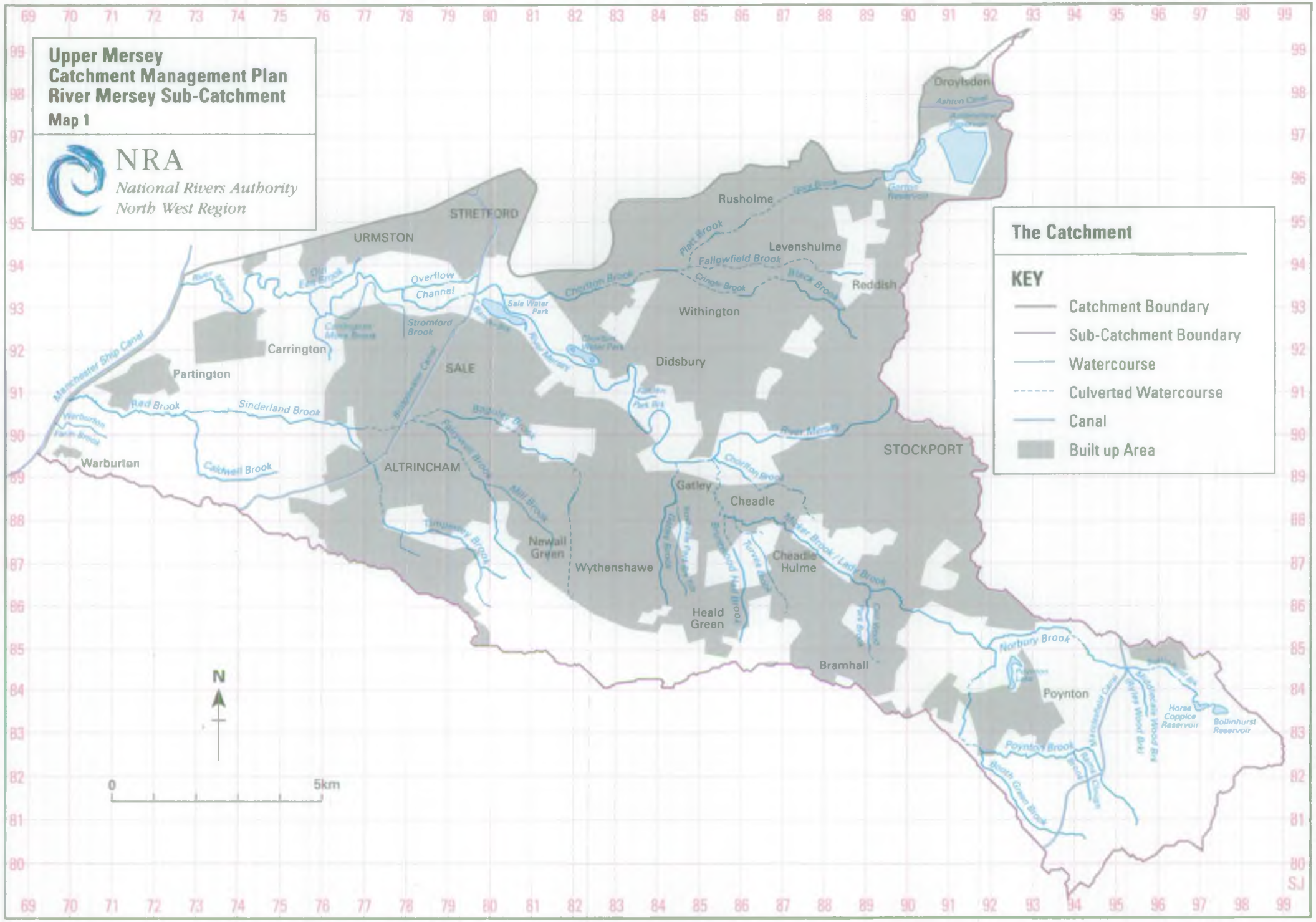

NRA North West S7

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1 CATCHMENT MANAGEMENT PLANNING - CONCEPT AND PROCESS

1.1 THE NATIONAL RIVERS AUTHORITY (NRA)

The NRA's mission statement is as follows:

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

The NRA established in 1989, is responsible for protecting and improving the water environment within England and Wales. It has a wide range of responsibilities which include:

- Flood defence, including the protection of people and property.
- Flood warning.
- Effective management of water resources.
- Control of pollution and improving the quality of rivers, groundwaters and coastal waters.
- Maintenance and improvement of fisheries.
- Promotion of water based recreation including navigation.
- Conservation of the natural water environment.

To achieve its aims, the NRA must work with or seek to influence central government, local government, industry, commerce, farming, environmental organisations, riparian owners and the general public. Successful management of the water environment requires consideration of a wide range of interests and requirements which may sometimes be in conflict.

1.2 ENVIRONMENT AGENCY

From April 1996 the Environment Agency will have all the powers and responsibilities of the NRA, combined with those of Her Majesty's Pollution Inspectorate (HMIP) and the Waste Regulation Authorities, thus giving control over the full range of environmental problem areas.

It is thought that future Catchment Management Plans (CMPs) will be of increased scope to cater for these wider responsibilities.

1.3 SCOPE AND PROCESS OF CATCHMENT MANAGEMENT PLANNING

The production of Catchment Management Plans within the NRA involves three stages:

- The Catchment Management Plan Consultation Report.
- The Catchment Management five year Action Plan.
- The Annual Review.

Consultation Report

The Consultation Report includes the following elements:

Vision

The vision expresses the realistic long term aims for the catchment within a context of up to 25 years.

Uses

The uses of the catchment are identified and discussed. Information is presented in the form of a map with supporting text. Uses that may have impact on the water environment and/or impose requirements on the water environment.

Objectives

The objectives for the use have been considered and summarised.

Issues Arising

Having considered the current state of the catchment and compared it to the objectives, the issues in need of rectification have been identified.

These are listed, referenced and are discussed in more details in the issues section.

Issues and Options

The identified issues are discussed and where possible some options for their resolution are proposed.

The Catchment Management Consultation Plan is intended to form a basis for consultation between the NRA and all those with interests in the catchment.

Consultees may wish to:

- Raise additional issues not identified in the plan.
- Comment on the issues and options identified in the plan.
- Suggest alternative options for resolving identified issues.

The NRA recognises that many of the issues and options for action identified by the consultation plan will involve organisations or individuals other than the NRA and their views will be crucial to the preparation of the Action Plan.

Catchment Management Action Plan

The Action Plan will be produced following consultation and will have regard to the comments received. Once produced, the plan will form a basis for the NRA's actions within the catchment for the next five years and also provide a public document forming a framework for the NRA's interaction with other organisations. The NRA will be seeking commitment to planned actions by others wherever possible.

Annual Review

The NRA will be jointly responsible, with other identified organisations and individuals, for implementing the Action Plan. Progress will be monitored and normally reported annually, by means of a review document which will be publicly available.

The review document will comprise the following information:

- A detailed comparison of actual progress against planned progress.
- Identification of additional actions to maintain progress in the light of changes in the catchment.
- Consideration of the need to update the Catchment Management Plan.

Update requirements will obviously depend on the particular needs of the catchment. However, updates to the management plan will normally be undertaken every five years. Key organisations and individuals forwarding comments will receive an annual review paper to update them with the action plan progress.

The Upper Mersey Catchment Management Plan Consultation Report (February 1996) attempts to highlight the most significant issues and solutions for rectification within a time scale of five years.

We would like to hear your views

- Have all the major issues been highlighted?
- Have all the options been considered for resolving the issues that have been identified?
- Do you have any comments to make regarding the plan in general?
- Comments on the Upper Mersey Catchment Management Plan Consultation Report should be received by 1st June 1996.
- All written responses shall be considered to be in the public domain unless Consultees explicitly request otherwise.
- If you would like further detailed information or would like to comment on this document please write to:

Catchment Management Planning Officer
National Rivers Authority
North West Region
"Mirwell"
Carrington Lane
SALE
M33 5NL

Tel: 0161-973-2237
Fax: 0161-973-4601

Front Cover Photograph: River Mersey, downsteam Ashton Weir, Flixton

2 OVERVIEW OF THE CATCHMENT

2.1 INTRODUCTION (Map 2: River Network)

For the purposes of this plan, the River Mersey sub-catchment consists of the River Mersey, down to the Manchester Ship Canal, Sinderland Brook and their tributaries, but excluding the Rivers Goyt, Bollin and Tame.

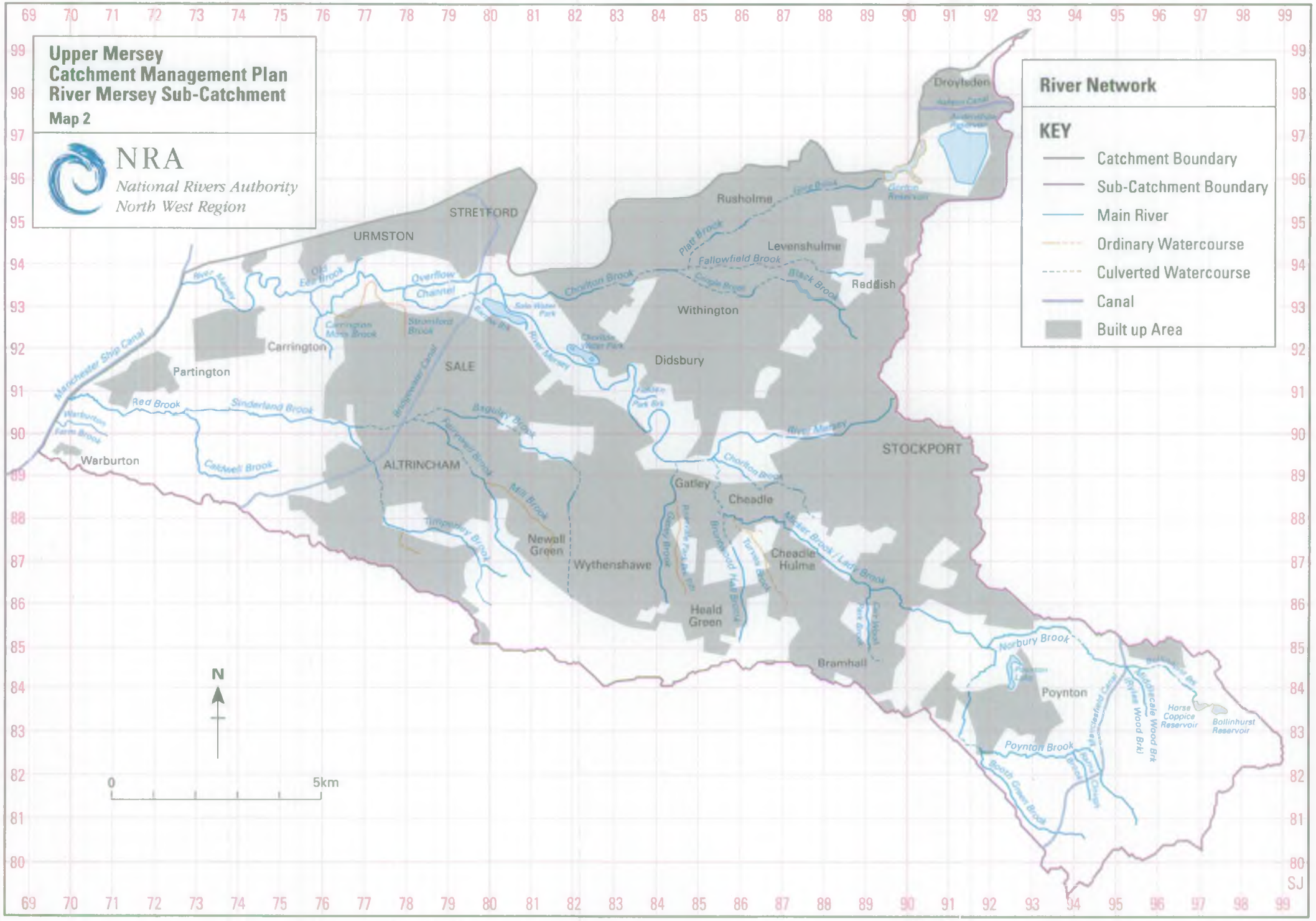
The River Mersey originates in Stockport, where the Goyt and Tame converge at an altitude of 40 m AOD. From Stockport the river flows in a westerly direction and is initially confined in a walled channel as far as Heaton Mersey, where the river begins to meander across the flood plain. The river flows past Northenden, Chorlton, Ashton-on-Mersey and Flixton, before outfalling into the Manchester Ship Canal over Irlam Weir at an altitude of 12 m AOD. As the Manchester conurbation has grown, development adjacent to the river has narrowed the river corridor and much of the channel has been embanked to prevent frequent flooding to the adjoining land. There are also two flood storage basins at Sale and Didsbury, which the NRA operate in very high flows, in order to limit uncontrolled flooding of the flood plain and the many recreational areas which utilise it.

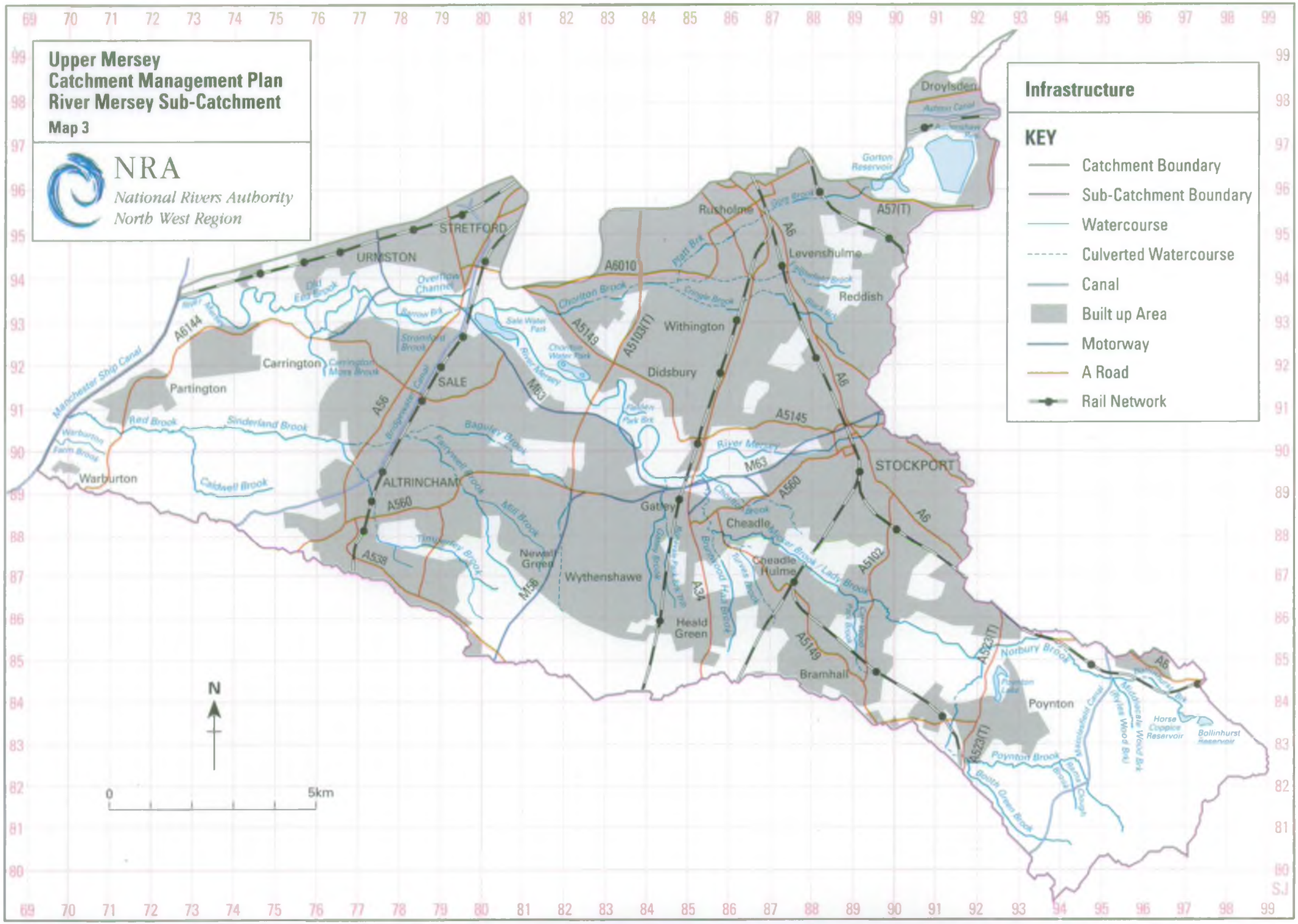
The largest tributary of the Mersey is Micker Brook, which drains South Stockport, Bramhall and Poynton, with altitudes rising to 400 m AOD. The confluence of Micker Brook with the Mersey is to the north of Cheadle. The next largest tributary of the Mersey is Chorlton/Platt/Gore Brook which drains the heavily urbanised areas of Chorlton, Fallowfield, Rusholme, Gorton and Audenshaw. Due to the demand for land in the City of Manchester, there are many culverted sections along the brook. It has its confluence with the Mersey at Sale Ees.

Although not a tributary of the Mersey, Sinderland Brook has been included in this sub-catchment and flows in a westerly direction draining Altrincham, Timperley, Baguley and Wythenshawe, before it joins the Manchester Ship Canal at Partington.

The total catchment area of the River Mersey is 223km^2 and the areas of some of the main tributaries are as follows:-

Chorlton/Platt/Gore Brook	40km^2
Micker Brook	65km^2
Sinderland Brook	58 km^2


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 2
NRA
National Rivers Authority
North West Region
River Network
KEY
Catchment Boundary
Sub-Catchment Boundary
Main River
Ordinary Watercourse
Culverted Watercourse
Canal
Built up Area
STRETFORD
URMSTON
Droylsden
Rusholme
Levenshulme
Reddish
Withington
Didsbury
Carrington
Partington
SALE
Warburton
ALTRINCHAM
STOCKPORT
Gatley
Cheadle
Cheadle Hulme
Newall Green
Wythenshawe
Heald Green
Bramhall
Poynton
Manchester Ship Canal
River Mersey
Red Brook
Sinderland Brook
Bridgewater Canal
Baguley Brook
Fallowfield Brook
Mill Brook
Timperley Brook
Cathwell Brook
Chorlton Brook
Platt Brook
Fallowfield Brook
Black Brook
Overflow Channel
Carrington Moss Brook
Stretford Brook
Sale Water Park
Chorlton Water Park
Fallowfield Brook
Cheadle Park Brook
Bromfield Hall Brook
Turnage Brook
Micker Brook / Ladybrook
Norbury Brook
Poynton Brook
Booth Green Brook
Poynton Lake
Horse Coppice Reservoir
Bollinhurst Reservoir
N
0
5km
SJ


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 3
NRA
National Rivers Authority
North West Region
Infrastructure
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
Motorway
A Road
Rail Network
N
0
5km
STRETFORD
URMSTON
SALE
ALTRINCHAM
Carrington
Partington
Warburton
Manchester Ship Canal
Red Brook
Sinderland Brook
Baguley Brook
Fairywell Brook
Mill Brook
Timperley Brook
Newall Green
Wythenshawe
Gatley
Heald Green
Cheadle
Cheadle Hulme
Bramhall
Withington
Didsbury
Rusholme
Levenshulme
Reddish
Droylsden
Gorton Reservoir
STOCKPORT
Poynton
Poynton Brook
Norbury Brook
Horse Coppice Reservoir
Bollinhurst Reservoir
River Mersey
Chorlton Brook
Platt Brk
Longford Park Brk
Fallowfield Brook
Turnage Brook
Mauldeth Wood Brk
Bowdon Brook
Sale Water Park
Chorlton Water Park
Strandway Brook
Barrow Brk
Old Edge Brook
Overflow Channel
Carrington Moss Brook
Bridgewater Canal
Ashton Canal
Macclesfield Canal
A6144
A56
A560
A538
M63
M56
A5149
A5103(T)
A6010
A5145
A34
A5102
A523(T)
A57(T)
A6

2.2 MERSEY CATCHMENT DETAILS (MAP 3)

AREA 223 km^2

MAIN TOWNS

Altrincham
Sale
Stockport
Stretford

ADMINISTRATIVE DETAILS

District Councils:-

Macclesfield Borough Council
Manchester City Council
Stockport Metropolitan Borough Council
Tameside Metropolitan Borough Council
Trafford Metropolitan Borough Council

NRA:- North West Region - South Area

Water Service Companies:- North West Water Limited

Principal Sewage Treatment Works:-

Stockport STW
Stretford STW
Sale STW
Altrincham STW
Partington STW

TOPOGRAPHY

Ground Levels:-	Min. Level	12 m AOD
	Max. Level	400 m AOD

GEOLOGY:-

Solid Geology:-	East	-	Carboniferous Coal Measures and Millstone Grit.
	North West	-	Permo-Triassic,Sherwood Sandstone.
	South West	-	Permo-Triassic, Mercia Mudstone.
Superficial Geology:-	East	-	Predominantly Glacial Till (Boulder Clay) Sand, and Gravel

WATER RESOURCES

Availability:-	Groundwater	-	Generally site specific
	Surface Water	-	Good availability

Flow Monitoring Stations within the Mersey catchment:-

			Daily Flows M^3/sec		
Station	**Watercourse**	**NGR**	**Maximum**	**Median**	**Minimum**
Brinksway	Mersey	SJ 8844 9003	250	9.2	1.3
Ashton Weir	Mersey	SJ 7723 9356	401	7.4	1.9
Partington	Sinderland Brook	SJ 7264 9047	12.3	0.4	.5

Largest Abstraction 163 Ml/d

Total Licensed Quantities

Groundwater 1,719Ml
Surface 13,741Ml

FLOOD PROTECTION

Length of Designated Main River:- (maintained by NRA) 126 km

Riparian owned debris screens cleaned by the NRA on a best endeavours basis:- 17

WATER QUALITY

Length of River in General Quality Assessment Chemical Grade

1994 Assessment

Grade A (Good)	0.0km	Grade D (Fair)	34.1km
Grade B (Good)	20.8km	Grade E (Poor)	19.3km
Grade C (Fair)	18.6km	Grade F (Bad)	5.1km

FISHERIES

Length of trout (salmonid) fishery:-	5.8km
Length of coarse fishery (cyprinid) fishery:-	20.3km

CONSERVATION

DESIGNATED SITES

Sites of Special Scientific Interest (SSSI):-	1
SSSI's associated with River Corridor and/or wetland habitats:-	1
Site of Biological Importance (SBI):-	58
SBI's which are associated with River Corridor and/or wetland habitats:-	46
Regionally Important Geological/Geomorphological Sites (RIGS):-	10
Scheduled Ancient Monuments (SAM)	9

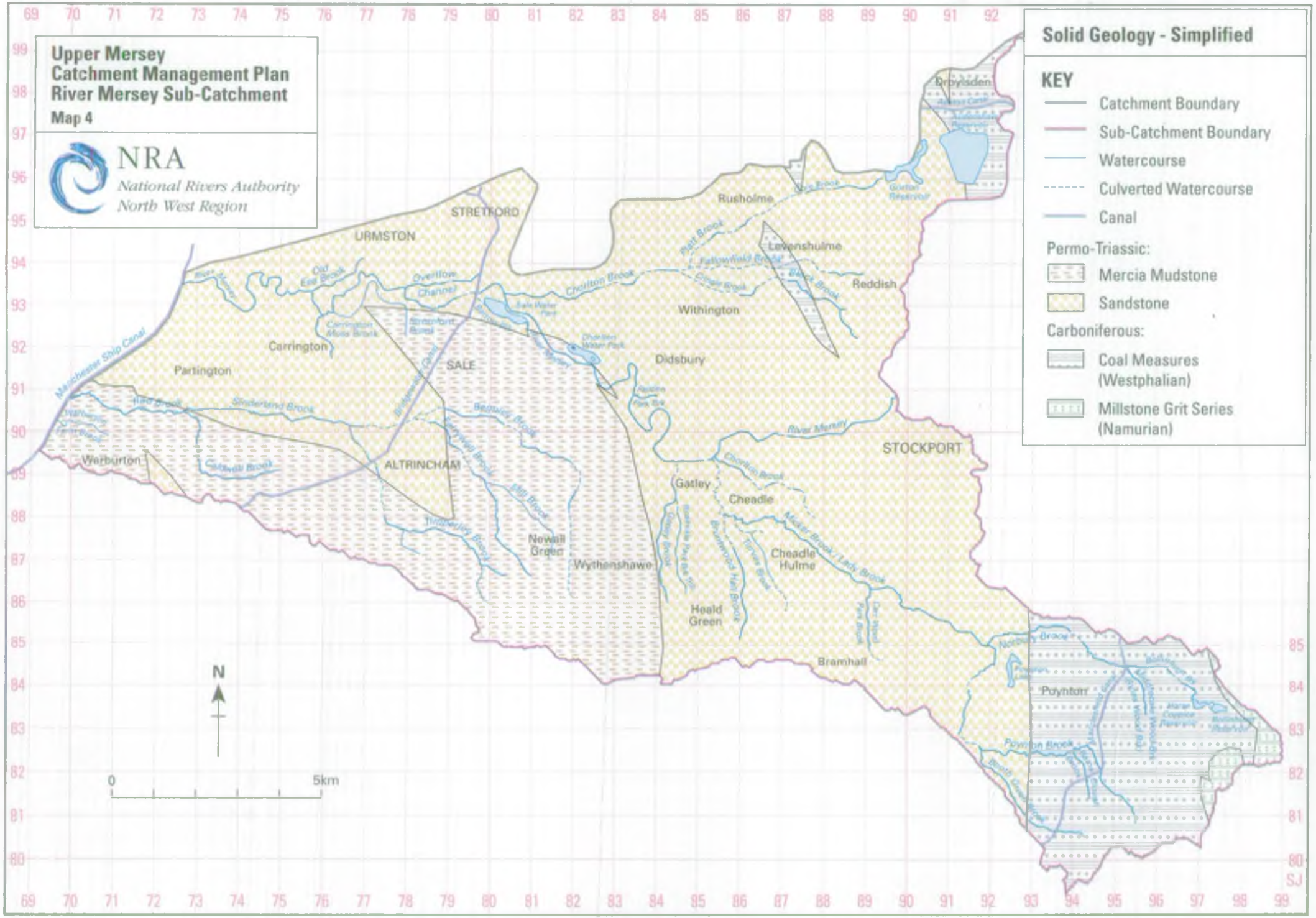
2.3 HYDROLOGY

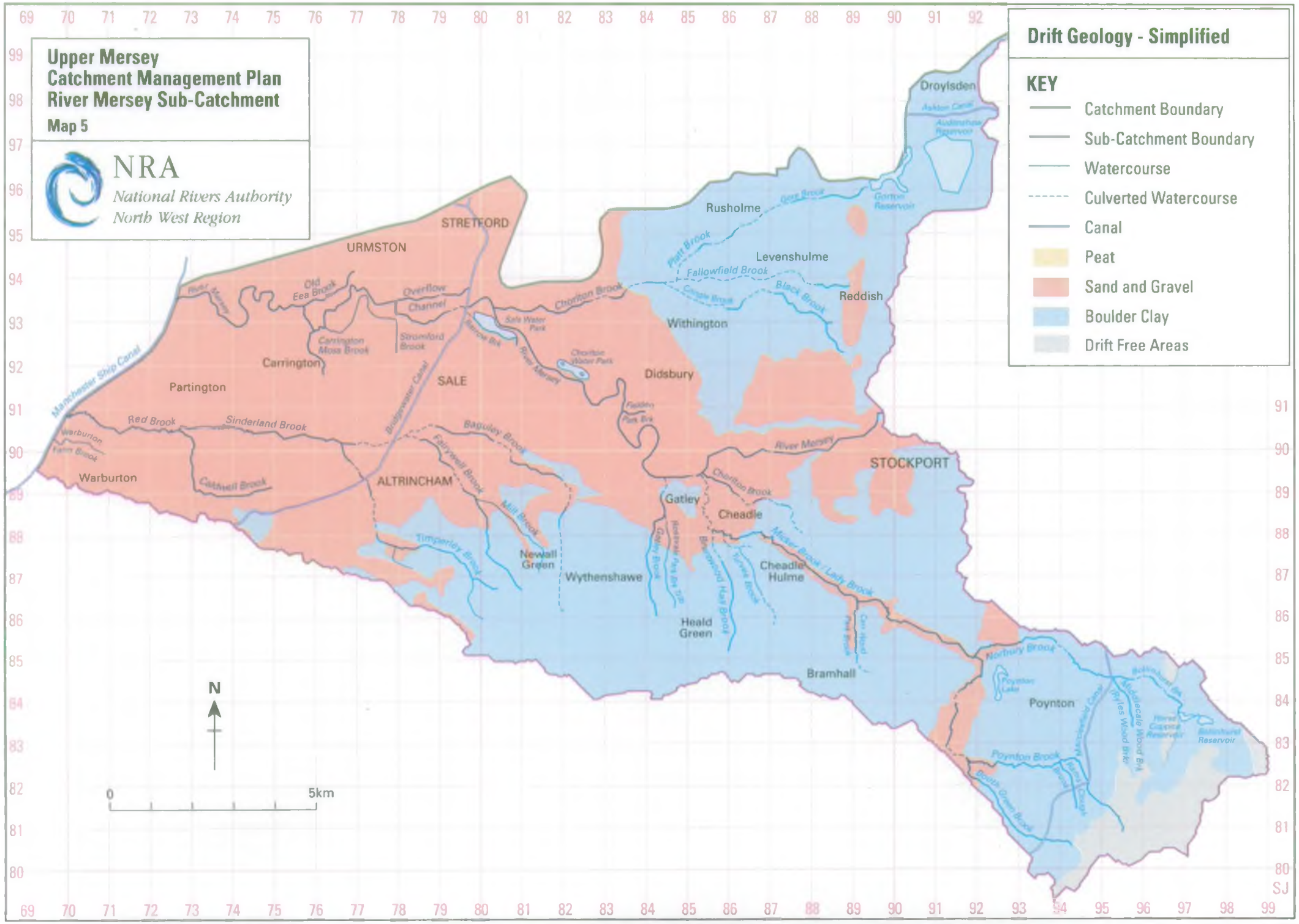
Average rainfall varies from 927 mm to 812 mm near the confluence with the Manchester Ship Canal.

The actual rainfall recorded for the Mersey catchment as recorded at **Sale Raingauge** in recent years is:-

Year	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**LTA 1961-1990**
Rain-fall mm	866	864	896	783	757	590	800	789	845	586	832

LTA - Long Term Average


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 4
NRA
National Rivers Authority
North West Region
Solid Geology - Simplified
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Permo-Triassic:
Mercia Mudstone
Sandstone
Carboniferous:
Coal Measures (Westphalian)
Millstone Grit Series (Namurian)
STRETFORD
URMSTON
Rusholme
Levenshulme
Reddish
Withington
Didsbury
Carrington
Partington
SALE
Manchester Ship Canal
Werburton
ALTRINCHAM
Newall Green
Wythenshawe
Gatley
Cheadle
Cheadle Hulme
Heald Green
Bramhall
STOCKPORT
Poynton
River Mersey
N
0
5km


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 5
NRA
National Rivers Authority
North West Region
Drift Geology - Simplified
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Peat
Sand and Gravel
Boulder Clay
Drift Free Areas
Droylsden
Rusholme
Levenshulme
Reddish
Withington
Didsbury
STRETFORD
URMSTON
SALE
Carrington
Partington
Warburton
ALTRINCHAM
Gatley
Cheadle
STOCKPORT
Newall Green
Wythenshawe
Heald Green
Cheadle Hulme
Bramhall
Poynton
Manchester Ship Canal
Bridgewater Canal
River Mersey
Chorlton Brook
Fallowfield Brook
Black Brook
Red Brook
Sinderland Brook
Baguley Brook
Fairywell Brook
Mill Brook
Timperley Brook
Cathwell Brook
Micker Brook / Lady Brook
Northenden Brook
Poynton Brook
N
0
5km
SJ

2.4 GEOLOGY (Maps 4, 5: Solid and Drift Geology)

The eastern part of the catchment is underlain by rocks of Carboniferous age (Coal Measures and Millstone Grit Series), comprising alternating sandstones, shales/mudstones and, in the case of the Coal Measures, occasional coal seams. To the west of a line running from Poynton to Audenshaw the watercourses pass onto younger Permo-Triassic rocks. These are predominantly Sherwood Sandstones, although Timperley Brook, Fairywell Brook, Baguley Brook, Caldwell Brook and Warburton Farm Brook all rise on the finer grained sediments of the Mercia Mudstone Group, which are present in the south and west of the catchment.

With the exception of the more erosion resistant Carboniferous sandstones, which form the higher ground east of Poynton, the solid rocks of the entire catchment are overlain by "drift deposits", mainly of glacial origin. Boulder Clay cover is predominant in the north east and south east whereas extensive "fluvio-glacial" sands and gravels have developed in the centre and west of the catchment, flanking the Mersey, Chorlton Brook and Sinderland Brook. In addition, alluvial deposits occur within the flood plains of the various watercourses.

2.4.1 Mineral Extraction

The coals within the Carboniferous sequence were worked in the past by underground methods around Poynton. Localised quarrying of the Carboniferous sandstones for building and roadstone may have taken place further east.

Elsewhere, mineral extraction within the catchment has been predominantly associated with the drift deposits; sand and gravel for aggregates and the boulder clay for brick manufacture. Most of these old workings are likely to have been infilled with domestic waste.

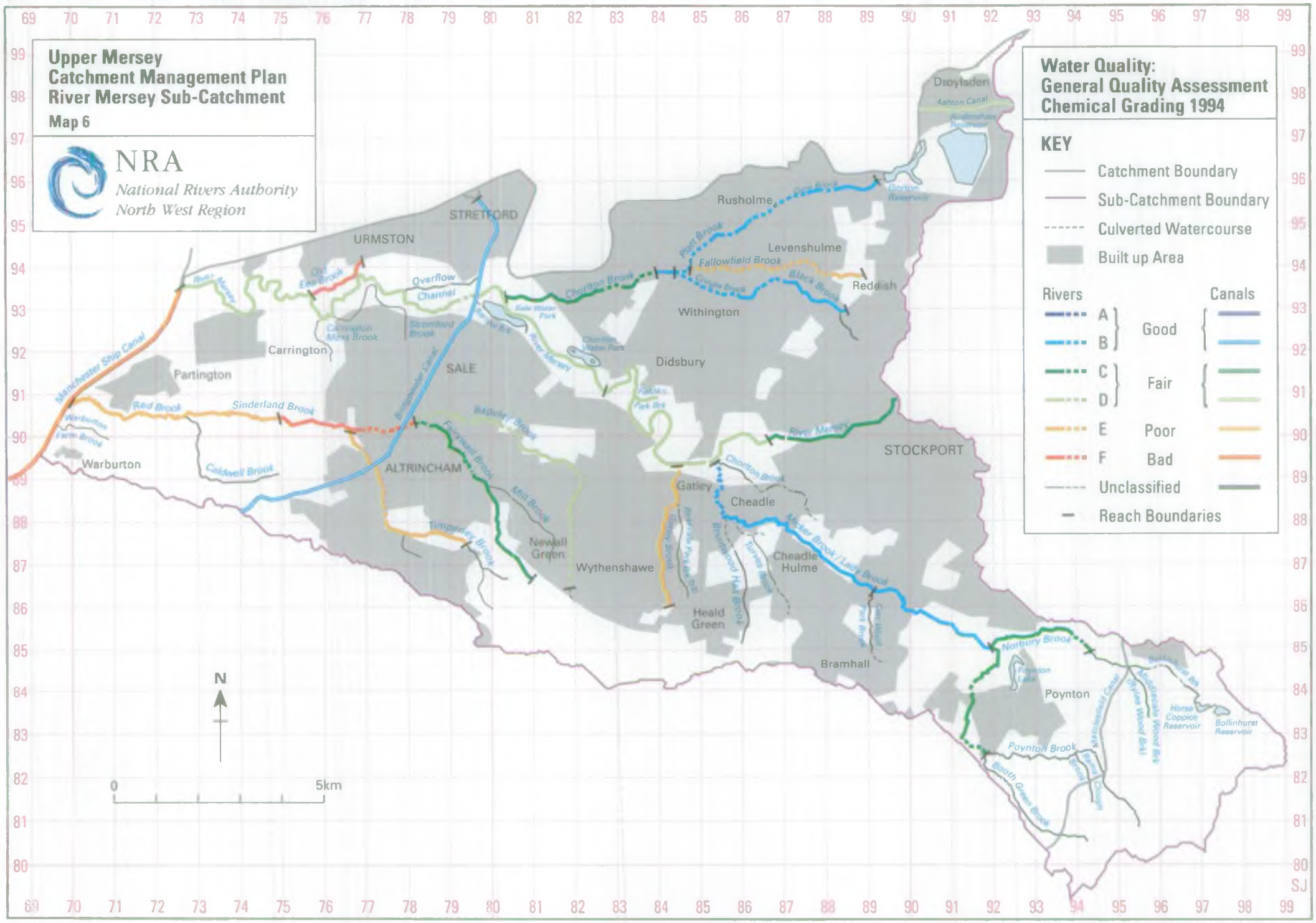
A Planning Application has been submitted to undertake open cast mining at Tower Farm, Poynton. This may result in low flow in a section of Norbury Brook adjacent to the site and a local lowering of the water table (**Issue SS2**).

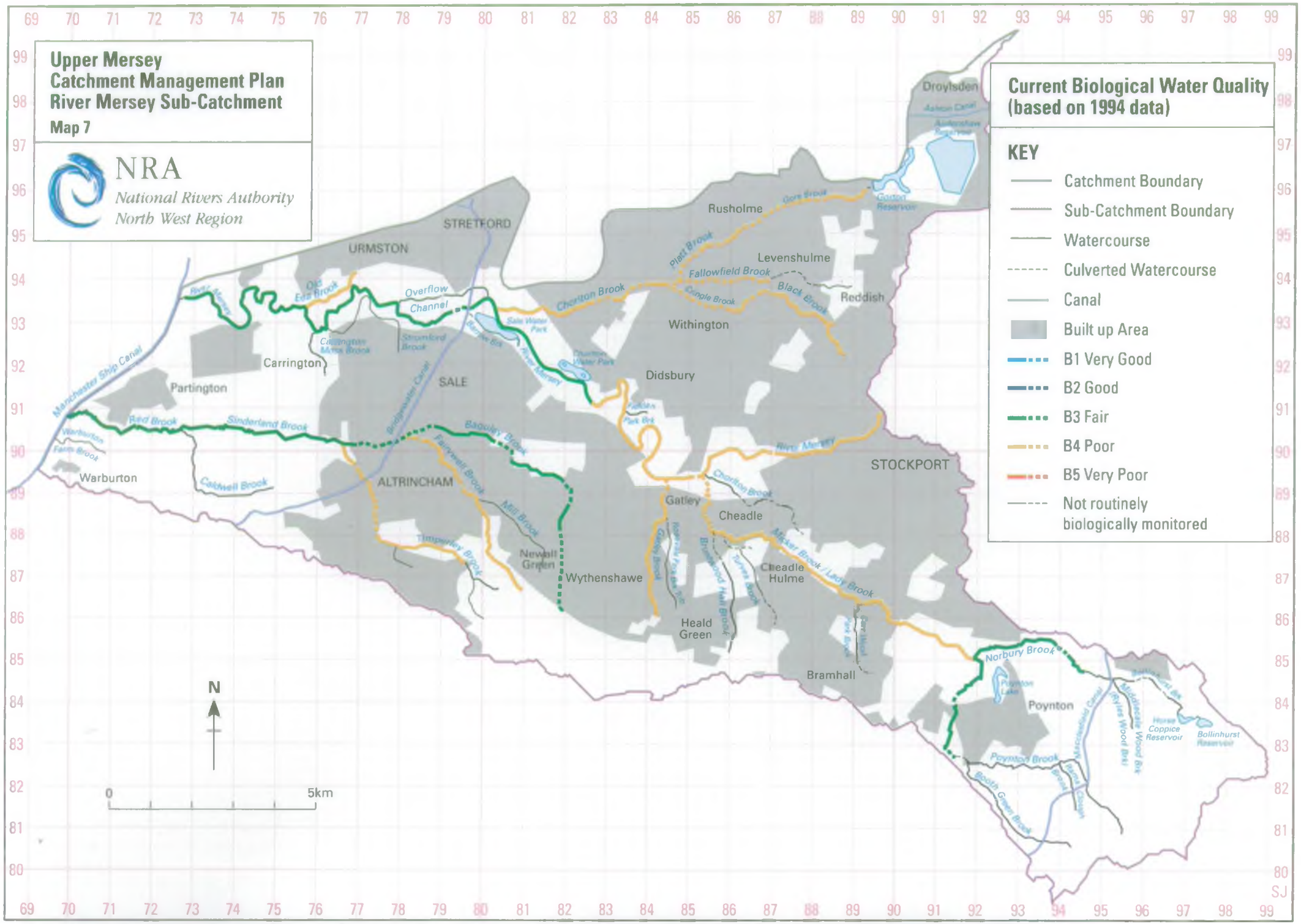
2.5 HYDROGEOLOGY

The Carboniferous sandstones tend to act as individual minor aquifer units separated by lower permeability shales/mudstones. Groundwater movement is generally by fissure flow. They are capable of supporting small scale agricultural and domestic supplies and may be used for such in areas remote from the mains water system.

In contrast, the Sherwood Sandstone forms a Major Aquifer, which extends from Macclesfield up to Manchester and westwards across to Merseyside. It is exploited for industrial and commercial purposes within the catchment. The Mercia Mudstones are generally of low permeability and are classed as "non-aquifer". However, they are capable of yielding limited quantities of groundwater.

Low permeability Boulder Clay will tend to inhibit recharge to the "solid" aquifers where present at depth, as well as affording some protection from polluting activities at the surface. In contrast, the more permeable drift deposits (sands and gravels) will act as "minor aquifers" in their own right, as well as providing potential pathways for recharge and contamination. They may be in hydraulic continuity with and contribute baseflow to watercourses which cross them.


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 6
NRA
National Rivers Authority
North West Region
Water Quality:
General Quality Assessment
Chemical Grading 1994
KEY
Catchment Boundary
Sub-Catchment Boundary
Culverted Watercourse
Built up Area
Rivers
Canals
A
B
Good
C
D
Fair
E
Poor
F
Bad
Unclassified
Reach Boundaries
STRETFORD
URMSTON
Dukinfield
Ashton Canal
Rusholme
Levenshulme
Reddish
Withington
Didsbury
Carrington
Partington
SALE
Warburton
ALTRINCHAM
Gatley
Cheadle
STOCKPORT
Newall Green
Wythenshawe
Cheadle Hulme
Heald Green
Bramhall
Poynton
Manchester Ship Canal
Red Brook
Sinderland Brook
Caldwell Brook
Bridgewater Canal
Timperley Brook
Mill Brook
Fallowfield Brook
Chorlton Brook
Black Brook
River Mersey
Norbury Brook
Poynton Brook
Booth Green Brook
Bollinhurst Reservoir
N
0
5km
SJ


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 7
NRA
National Rivers Authority
North West Region
Current Biological Water Quality
(based on 1994 data)
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
B1 Very Good
B2 Good
B3 Fair
B4 Poor
B5 Very Poor
Not routinely biologically monitored
Droylsden
Rusholme
Levenshulme
Reddish
Withington
Didsbury
STRETFORD
URMSTON
Carrington
Partington
SALE
ALTRINCHAM
Warburton
Gatley
Cheadle
STOCKPORT
Newall Green
Wythenshawe
Heald Green
Cheadle Hulme
Bramhall
Poynton
Manchester Ship Canal
Red Brook
Sinderland Brook
Baguley Brook
Fallowfield Brook
Mill Brook
Timperley Brook
Catchwell Brook
Old Eea Brook
Overflow Channel
Chorlton Brook
Platt Brook
Black Brook
Dingle Brook
Gore Brook
River Mersey
Bridgewater Canal
Norbury Brook
Poynton Brook
Booth Green Brook
Macclesfield Canal
Middlewood Way
Bollinhurst Reservoir
Horse Coppice Reservoir
N
0
5km

2.6 WATER QUALITY (Maps 6 & 7: General Chemistry Component)

A comprehensive monitoring programme of the chemical quality of the watercourses in the Mersey sub-catchment indicates that significant lengths of the rivers are of fair water quality.

The Mersey sub-catchment drains the southern area of the Greater Manchester conurbation and as such most of the catchment is given over to residential and trade developments. These built up areas are a significant source of pollution in the form of discharges from storm water overflows and urban run-off via surface water drainage from roads, commercial and domestic properties. Throughout the catchment there are problems with 'wrong connections', when foul drainage is piped into the surface water drains and these discharge into the nearest watercourse causing pollution.

The drainage from the limited farming operations does not, presently, have any significant impact.

The sewerage network that feeds the sewage treatment works, and some of the works have an impact on the water quality in the sub-catchment. These sewage treatment works and the network are the responsibility of North West Water Ltd (NWW Ltd).

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

Map 6 illustrates the results of the surveys of the chemical quality of rivers and canals in the catchment.

Biological Quality

The River Mersey in this sub-catchment fluctuates in biological quality between fair to poor. The fauna is dominated by pollution tolerant worms (tubificid), water hog louse (asellus) and midge larvae (chironomid). Sewage fungus and sewage litter are found at most sites.

Good water quality is indicated in Norbury Brook and Poynton Brook, which support a diverse fauna of pollution sensitive organisms including stoneflies, mayflies and caddis-fly larvae.

Water quality indicated in Abbey Hay Stream, Chorlton Brook, Cringle Brook, Gatley Brook and in the lower reaches of Micker Brook, is fair to poor and is affected by organic pollution. Faunas are dominated by water hog louse, tubificid worms and chironomid midge larvae. There are also problems with intermittent toxic pollution which causes sparse faunas. Oil, sewage fungus and sewage litter detract from the appearance of these tributaries.

The top of Gore Brook is affected by organic pollution, which affects biological quality (**Issue SS13**). There are also problems with toxic pollution indicated by periodic sparce faunas. Further downstream the water quality is slightly better indicated by pollution tolerant mayfly (baetidae) in the fauna. Sewage litter, sewage fungus and oil are commonly recorded.

Fallowfield Brook has a fauna indicating poor water quality due to organic pollution. Sewage fungus and sewage litter are widespread (**Issue SS35**).

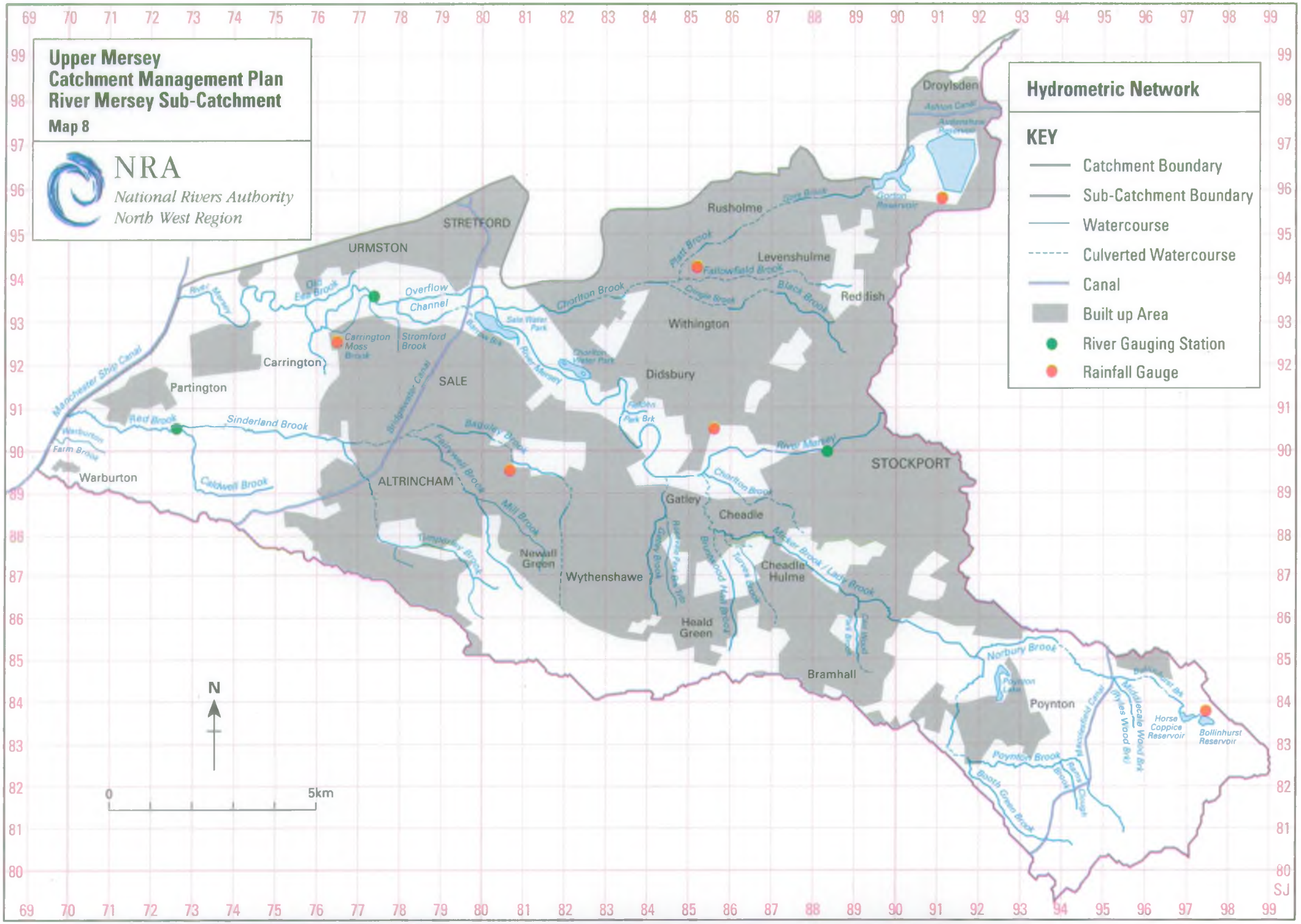
Old Eea Brook (**Issue SS36**) is affected by severe organic pollution and very poor water quality, with a fauna restricted to red chironomid midge larvae. Oil is frequently recorded here.

Sinderland Brook (**Issue SS39**) and Baguley Brook have variable water quality ranging from fair to poor. The fauna in Sinderland Brook is restricted in many places by organic pollution, with sewage litter widespread in the area of Altrincham STW (**Issue SS40**). There are sparse faunas on Baguley Brook due to toxic pollution.

Sparse faunas indicating toxic pollution, have also been recorded in Fairywell Brook (**Issue SS24**). Water quality varies between poor and very poor.

The upstream reach of Timperley Brook (**Issue SS29**) has records of sparse faunas, and is affected by alternating organic and toxic pollution. The fauna is generally restricted with midge larvae, worms and leeches being the commonest organisms found. In the lower reaches of Timperley Brook, water quality is poor to fair with a more diverse fauna affected by mild organic pollution.

Map 7 illustrates the results of the surveys of biological quality of rivers in the catchment.


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 8
NRA
National Rivers Authority
North West Region
Hydrometric Network
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
River Gauging Station
Rainfall Gauge
STRETFORD
URMSTON
Droylsden
Rusholme
Levenshulme
Reddish
Withington
Didsbury
SALE
Carrington
Partington
Warburton
ALTRINCHAM
STOCKPORT
Gatley
Cheadle
Cheadle Hulme
Newall Green
Wythenshawe
Heald Green
Bramhall
Poynton
Manchester Ship Canal
River Mersey
Red Brook
Sinderland Brook
Cadwell Brook
Old Edge Brook
Overflow Channel
Carrington Moss Brook
Stromford Brook
Bridgewater Canal
Sale Water Park
Chorlton Water Park
Chorlton Brook
Fallowfield Brook
Black Brook
Dingle Brook
Platt Brook
Spur Brook
Gorton Reservoir
Ashton Canal
Fallowfield Brook
Badsley Brook
Mill Brook
Timperley Brook
Fallowfield Brook
Fallowfield Park Brk
Chorlton Brook
Mosser Brook / Ladybrook
Norbury Brook
Poynton Lake
Poynton Brook
Boots Green Brook
Macclesfield Canal
Middlecale Wood Brk
Styles Wood Brk
Horse Coppice Reservoir
Bollinhurst Reservoir
N
0
5km
69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99
SJ

2.7 HYDROMETRIC NETWORK (Map 8: Hydrometric Network)

In the Mersey catchment, there are three level monitoring stations, two of which are on the River Mersey. At Brinksway, 1.5 km. west of Stockport, the station records level in an open channel mainly for Flood Warning purposes. The record starts from 1955. There is no bed control at this location and, therefore, it is not suitable for accurate hydrometric flow measurement **(Issue SS3)**.

At Ashton Weir, 18km downstream, the record starts from 1958. River levels are recorded over a compounded broad-crested weir primarily for Water Quality purposes. However, the weir crest is in a poor state of repair and requires urgent attention **(Issue SS19)**.

On Sinderland Brook, 2km south of Partington, levels are measured over a compounded crump weir. Records began in 1968 and data is used for Water Quality purposes.

Until recently, there has been no water level information on Timperley Brook. An interrogable river level gauge was installed in October 1995, where the brook passes beneath the Bridgewater Canal and, this will now provide levels for flood warning purposes.

There is a site of an abandoned gauging station on Micker Brook, close to the confluence with the Mersey. This was abandoned because the weir control structure frequently caught debris, making it impossible to calibrate a stage-discharge relationship. If sufficient demand for hydrometric data for Micker Brook exists, then the weir could be reconstructed and the gauging station could be re-established **(Issue SS4)**.

Readings from 6 rain-gauge sites within the Mersey catchment are received by the NRA. All 6 of these are NRA monitored sites. Two of the NRA sites are Tipping Bucket Rain-gauges (TRB) measuring daily totals and intensities. At both sites, there are also standard rain-gauges recording daily totals only. The locations of these rain-gauges are:

Audenshaw Reservoir
Denton Reservoir
Lyme Park, Disley
Parts Wood (TBR)
Sale (TBR)
Wythenshawe College

3 CATCHMENT USES AND TARGETS

3.1 WATER QUALITY

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

3.1.2 NRA Monitoring Duties

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

3.1.3 Water Quality Targets

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

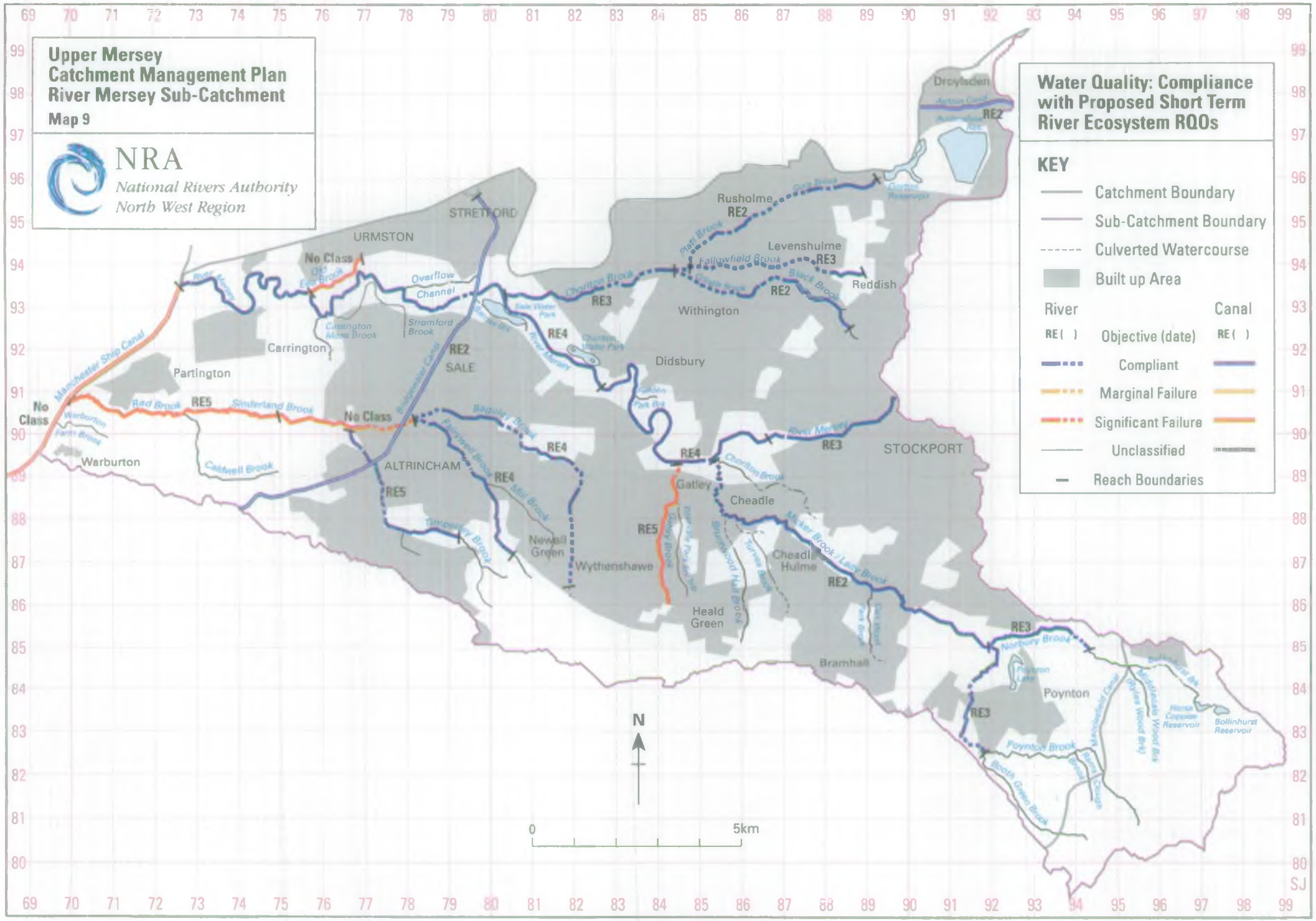
3.1.4 Water Quality Classification

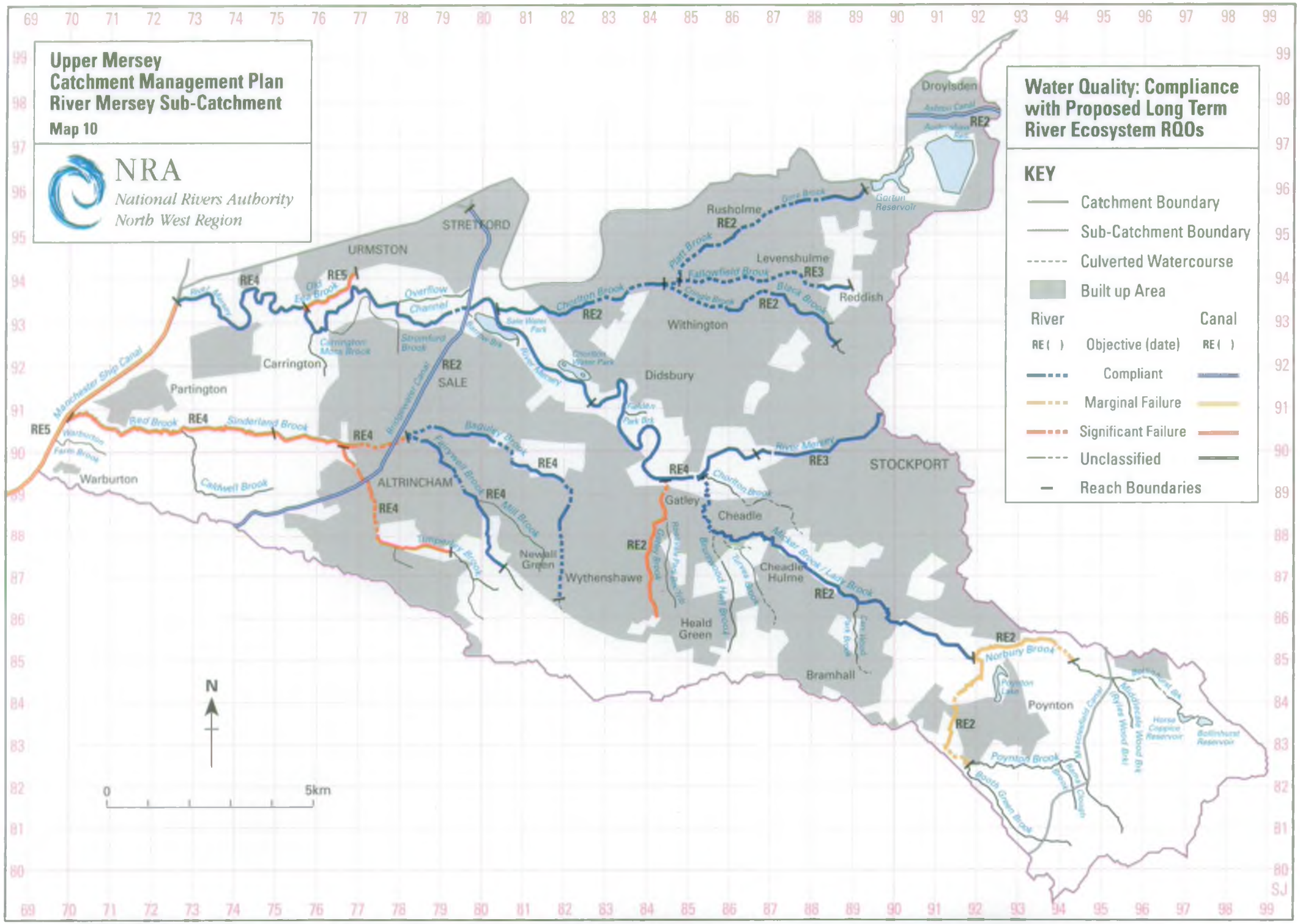
River Quality Objectives

The NRA has strategic targets known as River Quality Objectives (RQOs) which provide a basis for water quality management decisions. In the past the National Water Council (NWC) classification scheme for water quality has been a fundamental element of RQOs. This is now being superseded by new classification schemes, prescribing standards for specific uses. The first set of standards to be developed, in the River Ecosystem scheme, relates to the chemical quality requirements of different types of aquatic ecosystem. Details of the standards applying are given in **Appendix 3**.

River Ecosystem RQOs, for the rivers and canals of this catchment, are proposed here for the first time. Objectives under this scheme will ultimately become statutory targets, when notices are served by the Secretary of State for the Environment, giving them legal status. Although a formal public consultation will take place before the objectives become statutory, **views on the proposals are sought at this stage.**

The lengths of river and canal to which the objectives have been applied are largely the same as previously used for the NWC system of classification and objectives.


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 9
NRA
National Rivers Authority
North West Region
Water Quality: Compliance with Proposed Short Term River Ecosystem RQOs
KEY
Catchment Boundary
Sub-Catchment Boundary
Culverted Watercourse
Built up Area
River
Canal
RE( )
Objective (date)
RE( )
Compliant
Marginal Failure
Significant Failure
Unclassified
Reach Boundaries
STRETFORD
URMSTON
Rusholme
RE2
Levenshulme
RE3
Reddish
Withington
Didsbury
Carrington
Partington
SALE
ALTRINCHAM
Warburton
STOCKPORT
Gatley
Cheadle
Cheadle Hulme
Heald Green
Wythenshawe
Newall Green
Bramhall
Poynton
Droylsden
No Class
RE4
RE5
Manchester Ship Canal
Bridgewater Canal
Overflow Channel
Red Brook
Sinderland Brook
Cadishead Brook
Baguley Brook
Fallowfield Brook
Platt Brook
Chorlton Brook
Black Brook
River Mersey
Micker Brook / Lady Brook
Norbury Brook
Poynton Brook
Booth Green Brook
Bollinhurst Reservoir
N
0
5km
SJ


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 10
NRA
National Rivers Authority
North West Region
Water Quality: Compliance with Proposed Long Term River Ecosystem RQOs
KEY
Catchment Boundary
Sub-Catchment Boundary
Culverted Watercourse
Built up Area
River
Canal
RE( )
Objective (date)
RE( )
Compliant
Marginal Failure
Significant Failure
Unclassified
Reach Boundaries
STRETFORD
URMSTON
Droylsden
Rusholme
Levenshulme
Reddish
Withington
Didsbury
Carrington
Partington
SALE
Warburton
ALTRINCHAM
Gatley
Cheadle
STOCKPORT
Newall Green
Wythenshawe
Cheadle Hulme
Heald Green
Bramhall
Poynton
Manchester Ship Canal
Bridgewater Canal
Red Brook
Sinderland Brook
Cathwell Brook
Baguley Brook
Fairywell Brook
Mill Brook
Timperley Brook
Chorlton Brook
River Mersey
Glazebrook
Micker Brook / Lady Brook
Norbury Brook
Poynton Brook
Bosts Green Brook
Fallowfield Brook
Black Brook
Pott Brook
Dane Brook
Old Eye Brook
Overflow Channel
Carrington Moss Brook
Stretford Brook
Sale Water Park
Chorlton Water Park
Fallowfield Park Brk
Bloomwood Hall Brook
Turves Brook
Gatley Brook
Ashton Canal
Gartun Reservoir
Poynton Lake
Middlewood Way Brk
Horse Coppice Reservoir
Bollinhurst Reservoir
RE2
RE3
RE4
RE5
N
0
5km
SJ

It is also possible to relate the classes of the previous NWC objectives to the River Ecosystem scheme. This has been considered in the assessment of the proposed River Ecosystem objectives in addition to what the water quality is currently like and how this is predicted to change. Changes in water quality could arise, for example, due to improvements in consented discharges, improvements to farm drainage or changes in land use. Unless improvements are known to be in hand, consented discharges are assumed to contain the maximum permitted pollutant load.

Objectives proposed for non-statutory RQOs and ultimately Statutory Water Quality Objectives (SWQOs) will be achievable within 10 years. The dates given for compliance will become part of the statutory obligation. In predicting improvements it has only been possible therefore, to consider expenditure which is firmly committed. The recent National document relating to water company expenditure, over the next five years, is of particular significance here.

It is envisaged that it will be possible to review statutory SWQOs after 5 years.

For the purposes of this plan long-term, River Ecosystem RQOs have also been considered. These are the achievable aspirations for the catchment. Achievement of the proposed long-term RQOs for some stretches may take longer than 10 years, or require expenditure not available before then. No dates have been ascribed to these.

The proposed short-term and long-term River Ecosystem RQOs for the classified lengths of the rivers and canals of the catchment are shown in **Appendix 4**.

Maps 9 shows the current state of compliance with the proposed short term River Ecosystem RQOs. **Map 10** shows the current state of compliance with the proposed long term River Ecosystem RQOs. The proposed objectives themselves are also recorded here. For the proposed current objectives, where no date is indicated this is because the objective applies with immediate effect.

Statistical procedures have been used to assess whether samples collected for particular stretches are within the appropriate chemical standards. Failures have been distinguished as either marginal or significant.

The definition of the River Ecosystem classes, in chemical terms, can be equated with the following broad descriptions, with particular reference to the fish population that could be expected to be supported by the ecosystem.

Class RE1:	Water of very good quality (suitable for all fish species)
Class RE2:	Water of good quality (suitable for all fish species)
Class RE3:	Water of fair quality (suitable for high class coarse fish populations)
Class RE4:	Water of fair quality (suitable for coarse fish populations)
Class RE5:	Water of poor quality (which is likely to limit coarse fish populations)
No Class:	Water of bad quality (in which fish are unlikely to be present)

Biological Water Quality Classification

The input of biological data to the current catchment management process is essential to support the issues raised on the strength of chemical data and also to highlight those issues which may only be indicated by assessing the composition of the invertebrate community.

Biological reporting is seen as being a vital ingredient in the routine assessment of water quality problems across the catchment and as a useful tool when tracing specific pollution problems.

The biological water quality classification method used in this report depends on the identification of freshwater invertebrate specimens to family level. Each family has a biological score allocated to it, the value being related to the tolerance of the whole family to pollution. Pollution sensitive species receive the highest score, up to a maximum of ten for some stoneflies, and pollution tolerant species such as worms are given the lowest value of one. Abundances are also recorded to make an assessment of the dominant invertebrates in the sample.

A number of biological indices are applied to the invertebrate information collected for each length of river and one of five biological classes listed below is assigned.

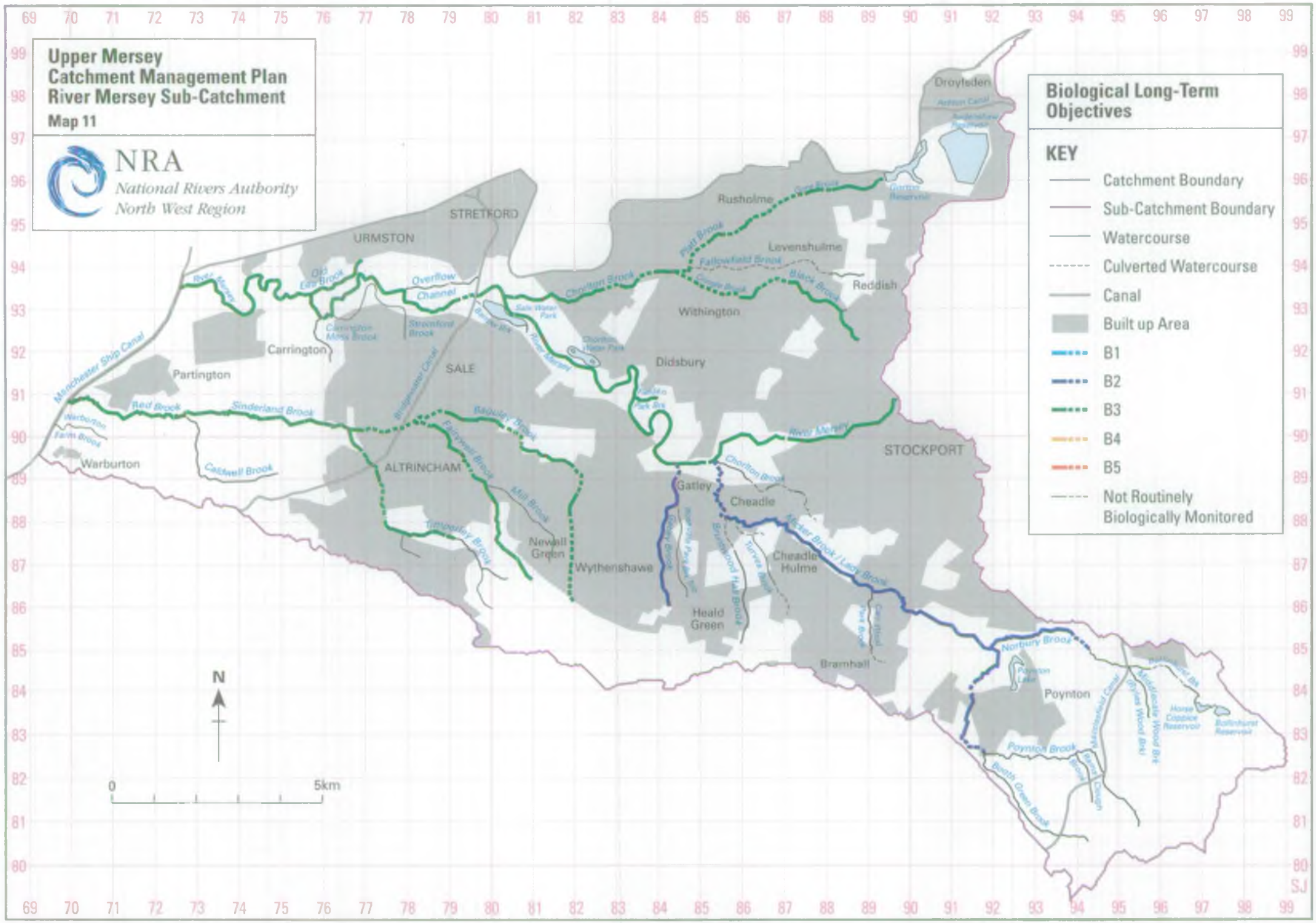
Biological class B1 - Very Good Biological Quality

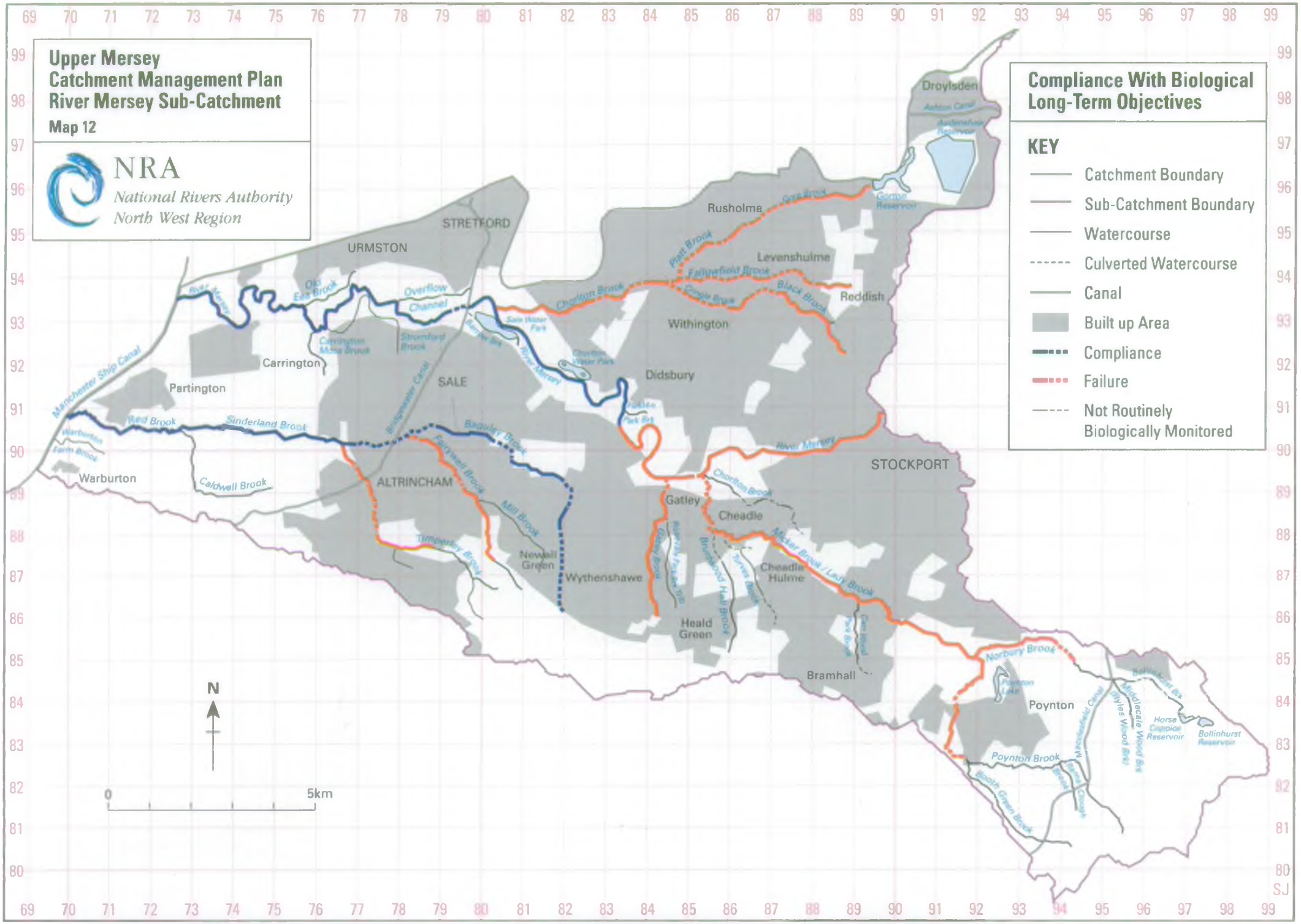
The fauna recorded is extremely diverse and dominated by a variety of stoneflies (Plecoptera) and mayflies (Ephemeroptera, not including the family Baetidae). Such groups require high levels of oxygen (>80%). The dominant invertebrates found are generally intolerant of pollution, particularly ammonia and organic pollution, preferring clean, well oxygenated streams. Some stonefly species are able to tolerate raised acidity levels, though most mayfly species are unable to tolerate this condition. Where such a diverse fauna is found, visible evidence of pollution is very rare.

Biological class B2 - Good Biological Quality

The indicative fauna is diverse and typically dominated by mayflies and caddis fly larvae (Tricoptera) with stoneflies in lower abundances than found in biological class B1. A few more pollution tolerant species such as shrimps (Gammaridae) are found, though the fauna still requires above average oxygen levels (>60%). The fauna will tolerate low ammonia levels and very mild organic pollution. Visible evidence of pollution is usually absent.

Caddis fly larvae tend to be less sensitive to organic pollution than stoneflies and mayflies. Shrimps (Gammaridae) are reasonably tolerant of mildly enriched conditions but will not tolerate conditions of increased acidity. Sometimes shrimps will form communities adapted to high levels of heavy metals.


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 11
NRA
National Rivers Authority
North West Region
Biological Long-Term Objectives
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
B1
B2
B3
B4
B5
Not Routinely Biologically Monitored
N
0
5km
Droylsden
Rusholme
Levenshulme
Reddish
Withington
Didsbury
STRETFORD
URMSTON
Carrington
Partington
SALE
Warburton
ALTRINCHAM
Gatley
Cheadle
STOCKPORT
Newall Green
Wythenshawe
Cheadle Hulme
Heald Green
Bramhall
Poynton
Manchester Ship Canal
Bridgewater Canal
Red Brook
Sinderland Brook
Warburton Farm Brook
Caldwell Brook
Old Lea Brook
Overflow Channel
Carrington Moss Brook
Stretford Brook
Sale Water Park
Chorlton Water Park
Chorlton Brook
Platt Brook
Fallowfield Brook
Black Brook
Gore Brook
Gorton Reservoir
Ashton Canal
Rabbiger Brook
Earlstree Brook
Mill Brook
Timperley Brook
River Mersey
Cheadle Brook / Lady Brook
Norbury Brook
Poynton Brook
Bonis Green Brook
Middlewood Canal
Bollinhurst Reservoir
SJ


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 12
NRA
National Rivers Authority
North West Region
Compliance With Biological Long-Term Objectives
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
Compliance
Failure
Not Routinely Biologically Monitored
Droylsden
Rusholme
Levenshulme
Reddish
Withington
Didsbury
STRETFORD
URMSTON
Carrington
Partington
SALE
Warburton
ALTRINCHAM
Gatley
Cheadle
STOCKPORT
Newall Green
Wythenshawe
Heald Green
Cheadle Hulme
Bramhall
Poynton
Manchester Ship Canal
River Mersey
Red Brook
Sinderland Brook
Caldwell Brook
Bridgewater Canal
Baguley Brook
Fairywell Brook
Mill Brook
Timperley Brook
Chorlton Brook
Micker Brook / Lady Brook
Norbury Brook
Poynton Brook
Bollinhurst Reservoir
Horse Carrion Reservoir
N
0
5km
SJ

Biological class B3 - Fair Biological Quality

The fauna is moderately diverse but typically dominated by more pollution tolerant families of mayflies (Baetidae), caddis fly larvae and shrimps. Pollution tolerant water hoglice (Asellidae) are frequently present, together with significant numbers of worms and midge larvae. Stoneflies are typically absent. Oxygen saturation (>40%) is typically sufficient to support pollution tolerant mayflies. Visible evidence of pollution may be present.

Biological class B4 - Poor Biological Quality

This class is indicated by a restricted fauna composed of pollution tolerant species. Water hoglice, worms and chironomids (midge larvae) are frequently present, whereas pollution sensitive stoneflies are absent. Water hoglice are fairly tolerant of high salinities, low pH and high metal concentrations. Shrimps and pollution tolerant mayfly species (Baetidae family) are only occasionally recorded. The fauna is able to tolerate low oxygen levels (>10%) and occasionally stagnant, anaerobic conditions, which may be associated with significant organic pollution or mild toxicity. Visible evidence of pollution is typically present.

Biological class B5 - Very Poor Biological Quality

This class is indicated by a very restricted fauna tolerant of severely polluted conditions. A macroinvertebrate fauna may in fact be absent altogether. Only species capable of utilising very low oxygen levels are found, for example, chironomids and worms. The fauna may be composed of very low abundances of a few species, indicating toxic conditions, or very high numbers of pollution tolerant species such as red midge larvae (bloodworms) or worms, indicative of gross organic pollution. Visible evidence of pollution is very common.

High numbers of red midge larvae (bloodworms) are particularly indicative of pollution by sewage or farm effluent. Worms are also tolerant of organic pollution.

The proposed long-term objectives for Biological Water Quality for the classified lengths of the catchment are also listed in Appendix 4, and shown on **Map 11**. The biological compliance is illustrated on **Map 12**.

3.1.5 EC Directives

Three Directives issued by the EC have implications for water quality in the Mersey sub-catchment.

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.

Most significant inland sewage treatment works already comply with the basic requirements relating to treatment.

However, the requirement that collecting systems (the sewerage system) shall be designed, constructed and maintained in accordance with best available technology 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 125 overflows have been identified within the Mersey sub-catchment. The NRA undertakes reviews of performance of overflows and is involved in the prioritisation of unsatisfactory overflows for inclusion in the capital programme of NWW Ltd.

With regard to direct discharges from the specified sectors of industry, standards for the appropriate level of treatment are being developed. It is unlikely that any of the direct discharges of industrial effluent, within the Mersey sub-catchment, will be affected by this requirement.

Directive on Water Quality for Freshwater Fish

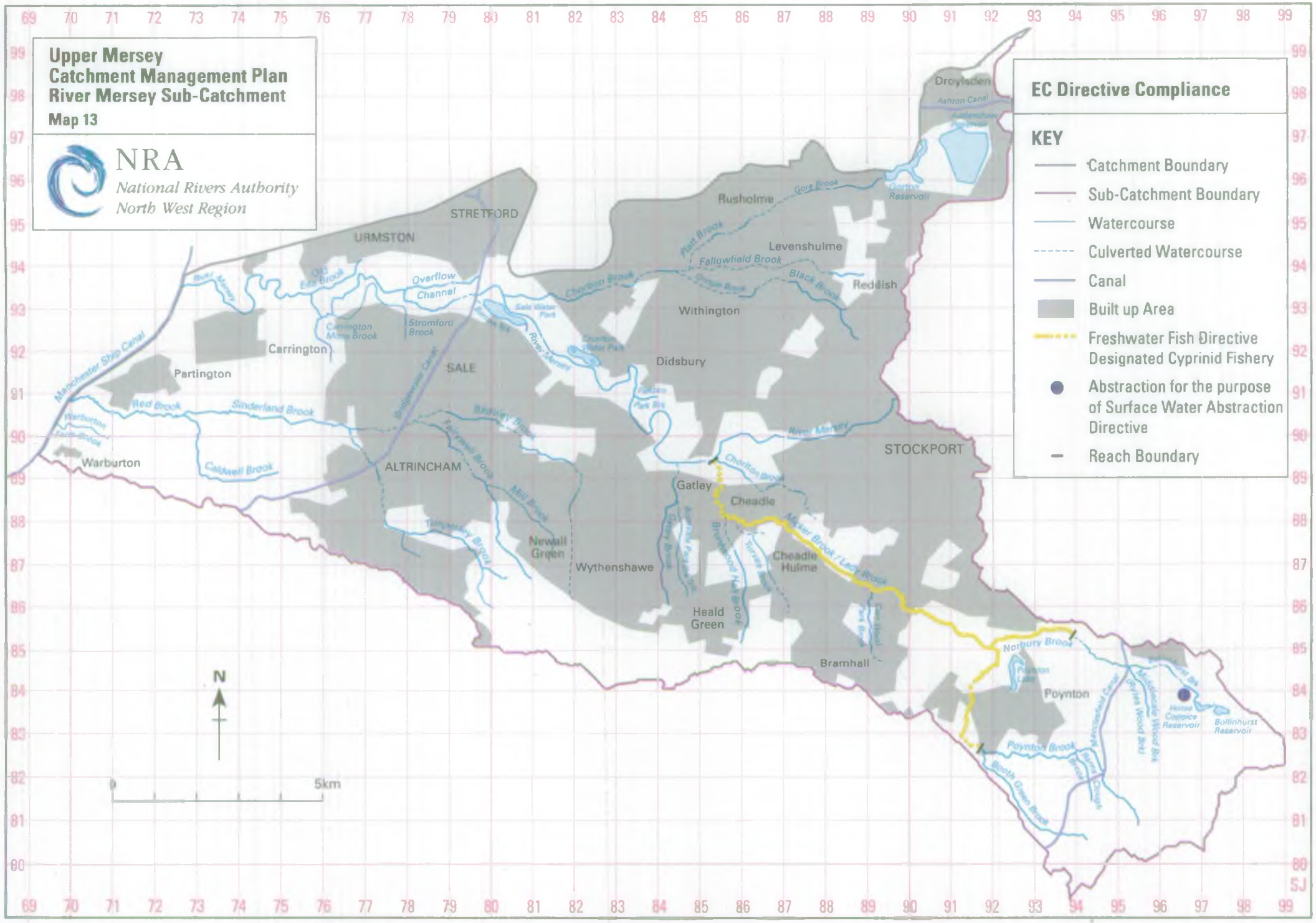
The Directive sets Environmental Quality Standards (EQSs) for stretches of freshwater designated as suitable for either salmonids (salmon and trout species) or cyprinids (coarse fish species).

There are two designated river stretches within the catchment, both are of cyprinid designation. The designated stretches are shown on **Map 13**. The most recent reports on compliance made to the Department of the Environment were on the basis of data from the calendar year 1994.

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.

One abstraction has been identified in the Mersey sub-catchment for the purposes of this Directive and these are shown on **Map 13**.


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 13
NRA
National Rivers Authority
North West Region
EC Directive Compliance
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
Freshwater Fish Directive Designated Cyprinid Fishery
Abstraction for the purpose of Surface Water Abstraction Directive
Reach Boundary
STRETFORD
URMSTON
Droylsden
Ashton Canal
Rusholme
Levenshulme
Reddish
Withington
Didsbury
Carrington
Partington
SALE
Warburton
ALTRINCHAM
STOCKPORT
Gatley
Cheadle
Newall Green
Wythenshawe
Cheadle Hulme
Heald Green
Bramhall
Poynton
Manchester Ship Canal
Red Brook
Sinderland Brook
Caldwell Brook
Bridgewater Canal
River Mersey
Overflow Channel
Stromford Brook
Carrington Moss Brook
Sale Water Park
Chorlton Water Park
Fallowfield Brook
Black Brook
Gore Brook
Gorton Reservoir
Chorlton Brook
Bakery Brook
Fairness Brook
Mill Brook
Tanyard Brook
Micker Brook / Lady Brook
Norbury Brook
Poynton Brook
Booth Green Brook
Macclesfield Canal
Bollinhurst Reservoir
House Coppice Reservoir
N
0
5km
SJ

The most recent reports on compliance made to the Department of this Environment were on the basis of data from the calendar year 1994.

3.1.6 Asset Management Plan 2 (AMP2)

The Asset Management Plan, of which this is the second, is essentially the Water Companies programme of expenditure and investment for the ten year period between 1995 and 2005.

The NRA is involved in setting priorities for work necessary for environmental improvements. The environmental related work for the first 5 years of the programme has essentially been confirmed. However, although schemes have been identified for the second 5 year period, between the years 2000 and 2005, they are still open to negotiation, and reprioritisation, according to what are deemed to be the most environmentally beneficial projects.

AMP2 programme 1995 -2000

The following list of schemes are those encompassed within the first five years of the AMP2 process for which improvement works will be carried out, within the Mersey sub-catchment area:

1. Unsatisfactory sewer overflows. The following unsatisfactory combined sewer overflows are to be improved to at least satisfactory quality within the first 5 years of the AMP2 process:

Catchment	NWW Reference	Stream	Grid reference	Location
Mersey	TAM0037	Trib Dick Lane Bk	SJ91409750	Lumb Lane/Audenshaw Relief sewer
Mersey	MAN0210	Moss Brook	SJ90149721	Hobson Street/Manshaw Road
Mersey	TAM0058	Gore Brook	SJ90179727	Manchester Road/Fairfield

2. Sale Sewage Treatment Works. The controlling inlet overflow is to be improved to alleviate aesthetic problems resulting from excessive litter being discharged from the overflow into Stromford Brook.

AMP2 programme 2000 - 2005

The following list of schemes are those encompassed within the second five years of the AMP2 process for which improvement works will be carried out, within the Mersey sub-catchment area. As mentioned previously these schemes are still open to negotiation, and reprioritisation:

1. Unsatisfactory sewer overflows. The following unsatisfactory combined sewer overflows are to be improved to at least satisfactory quality within the second 5 years of the AMP2 process:

Catchment	NWW Reference	Stream	Grid reference	Location
Mersey	STK0117	Black Brook	SJ87859318	Wellington Rd.Nth/Crossley Rd.
Mersey	STK0118	Black Brook	SJ87759327	Crossley Rd/Westholme Ave

3.2 EFFLUENT DISPOSAL

3.2.1 General

Domestic and industrial effluents may be discharged continuously or intermittently to the river system.

Continuous Effluents

Fully treated effluent from sewage treatment works and trade effluent treatment plants are typically continuous discharges.

The more significant sewage treatment works are almost exclusively operated by the Water Services Companies (WSCs). In the Mersey sub-catchment this is North West Water Ltd. 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 a discharge to a 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 a discharge to a watercourse, rather than discharge to sewer.

The quality of such continuous effluents is controlled by consents.

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 the water companies and the circumstances in which they are permitted to occur are controlled in consents.

Unfortunately, significant amounts of sewage debris, can often be seen on the bed and banks, over substantial lengths of watercourse, throughout the catchment. Such debris is released from the sewers through overflows. Properly designed overflows can reduce this.

Another category of intermittent effluent arises as a consequence of numerous storm water drains in the catchment being contaminated with domestic foul water from sinks, washing machines etc. Often such appliances are incorrectly drained to the storm water drains, and not the foul sewer as they should be. Although the impact is localised it is widespread throughout the catchment and can be both difficult and time consuming to trace.

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

3.2.2 Local Perspective

Continuous Effluents

There are five North West Water Ltd sewage treatment works within the catchment.

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

There are currently six industrial discharges direct to river. The locations of these discharges are shown on **Map 14**.

Intermittent Effluents

There are over 125 identified storm and emergency sewer overflows within the Mersey sub-catchment. Their locations are shown on **Map 14**.

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

3.2.3 Environmental Objectives

- There is a need to control continuous and intermittent discharges to achieve water quality targets for the catchment.

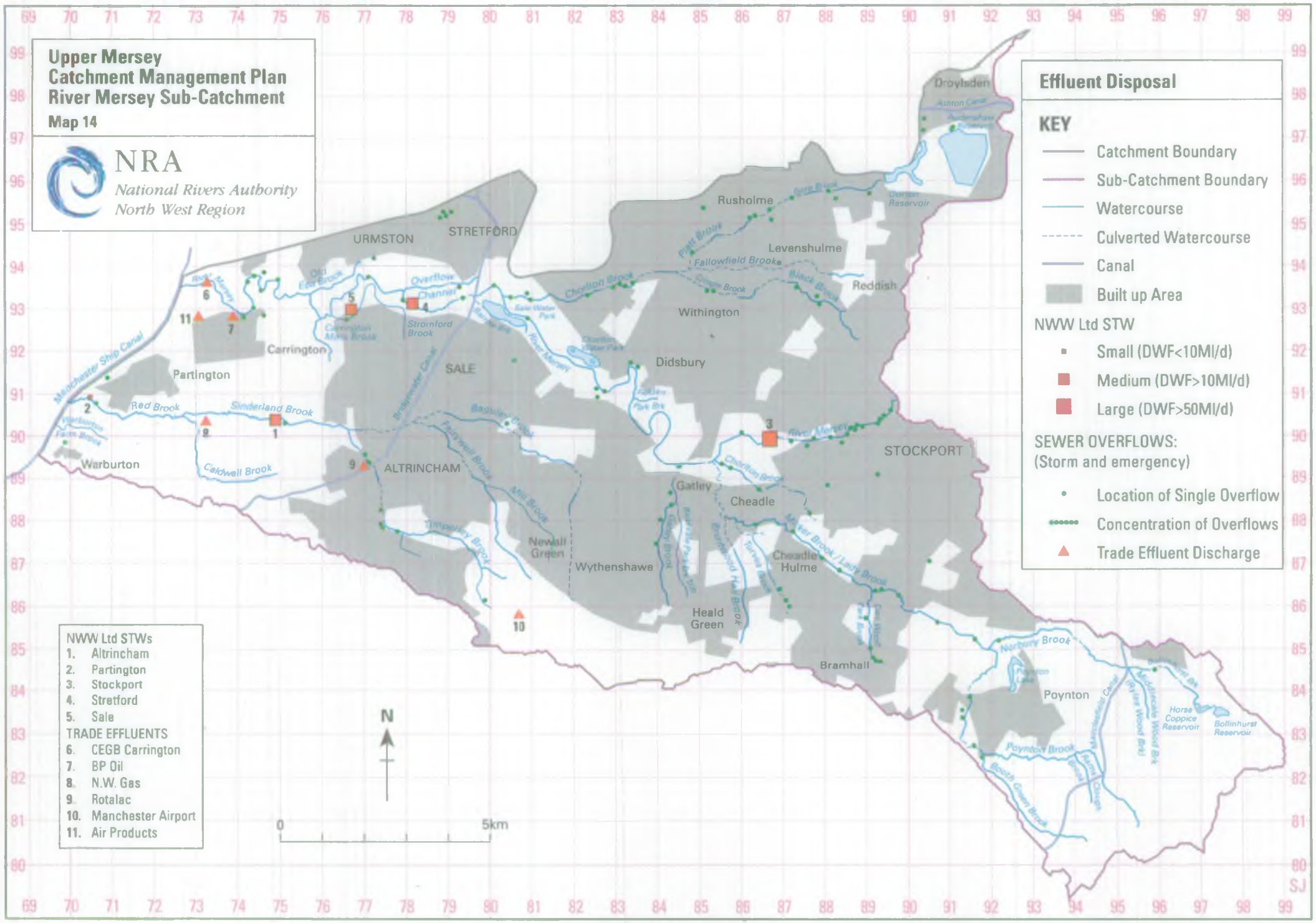
3.2.4 Environmental Requirements

Water Quality

- There is a requirement for no deterioration in water quality upstream of discharges as this would increase their impact on the river.

Water Quantity

- There should be no significant reduction in flows upstream of discharges as this would increase their impact on the river.


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 14
NRA
National Rivers Authority
North West Region
Effluent Disposal
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
NWW Ltd STW
Small (DWF<10Ml/d)
Medium (DWF>10Ml/d)
Large (DWF>50Ml/d)
SEWER OVERFLOWS:
(Storm and emergency)
Location of Single Overflow
Concentration of Overflows
Trade Effluent Discharge
NWW Ltd STWs
1. Altrincham
2. Partington
3. Stockport
4. Stretford
5. Sale
TRADE EFFLUENTS
6. CEGB Carrington
7. BP Oil
8. N.W. Gas
9. Rotalac
10. Manchester Airport
11. Air Products
N
0
5km
Droylsden
Rusholme
Levenshulme
Reddish
Withington
Didsbury
STOCKPORT
Cheadle
Gatley
Cheadle Hulme
Bramhall
Poynton
Heald Green
Wythenshawe
Newall Green
ALTRINCHAM
SALE
STRETFORD
URMSTON
Carrington
Partington
Warburton
Manchester Ship Canal
Red Brook
Sinderland Brook
Cadwell Brook
Bridgewater Canal
River Mersey
Stromford Brook
Fallowfield Brooke
Chorlton Brook
Mill Brook
Tippinley Brook
Norbury Brook
Poynton Brook
Bollinhurst Reservoir
Horse Coppice Reservoir
SJ

3.3 WATER ABSTRACTION - SURFACE WATER/GROUNDWATER

(Map 15: Licensed Abstractions : Industrial and Agricultural)

3.3.1 Industrial

Within the catchment there are only 14 licensed abstractions for industrial purposes, the majority of these being from groundwater (borehole) sources, which exploit the Sherwood Sandstone. Depending on the exact location, it may be possible to consider additional groundwater abstraction from this aquifer.

3.3.2 General Agriculture

The minor aquifers formed by the sandstone units of the Carboniferous era have been exploited to provide agricultural water supplies. The Mercia Mudstones are generally of low permeability, but maybe capable of yielding limited quantities of groundwater sufficient for agricultural use. All the licensed sources relate to groundwater sources, including springs, however, there are also surface water sources used within the catchment which are exempt from licensing requirements.

3.3.3 Spray Irrigation

There are 19 licensed abstractions for spray irrigation within the catchment. Those from borehole sources relate to use at garden centre nurseries and golf courses. The majority of surface water abstraction relates to a concentration of licences covering Sinderland Brook for crop irrigation, and this resource is fully committed to existing licensed abstractions. Any new applications would require the installation of storage facilities..

3.3.4 Environmental Objectives

The overall aim of water resources management is to ensure an appropriate balance between the needs of the environment and protecting existing abstractors and the demand for additional sources of water supply. This is achieved through the abstraction licensing process and the routine monitoring of all sources.

3.4 POTABLE (DRINKING) WATER SUPPLY (Map 16: Licensed Abstractions Public Supply)

3.4.1 Surface Sources

There is only one licensed source authorising abstraction for Public Water Supply, which relates to Bollinhurst and Horsecoppice reservoirs at Lyme Park, Disley. These reservoirs are not subject to any statutory compensation water discharges.

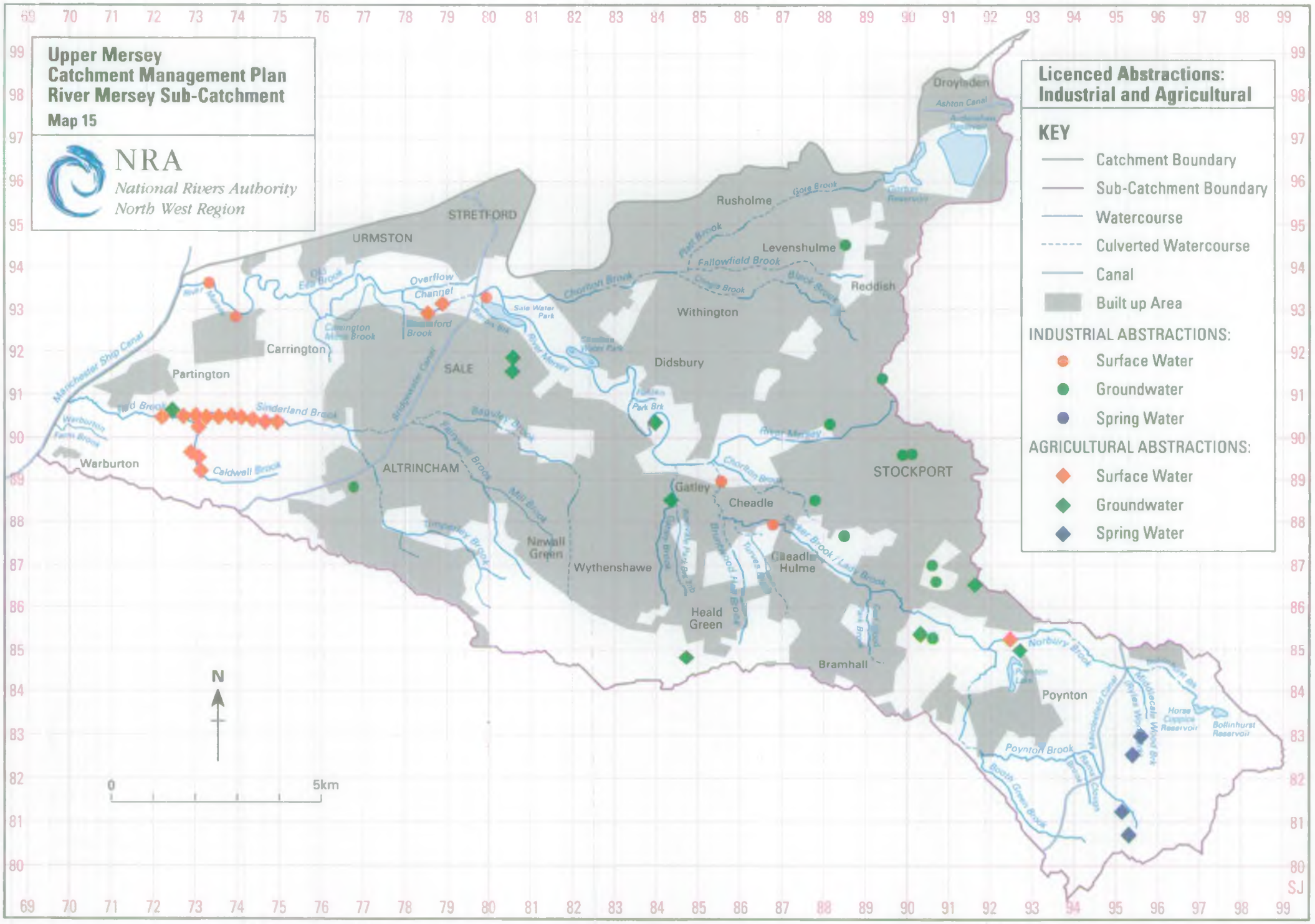
3.4.2 Groundwater Sources

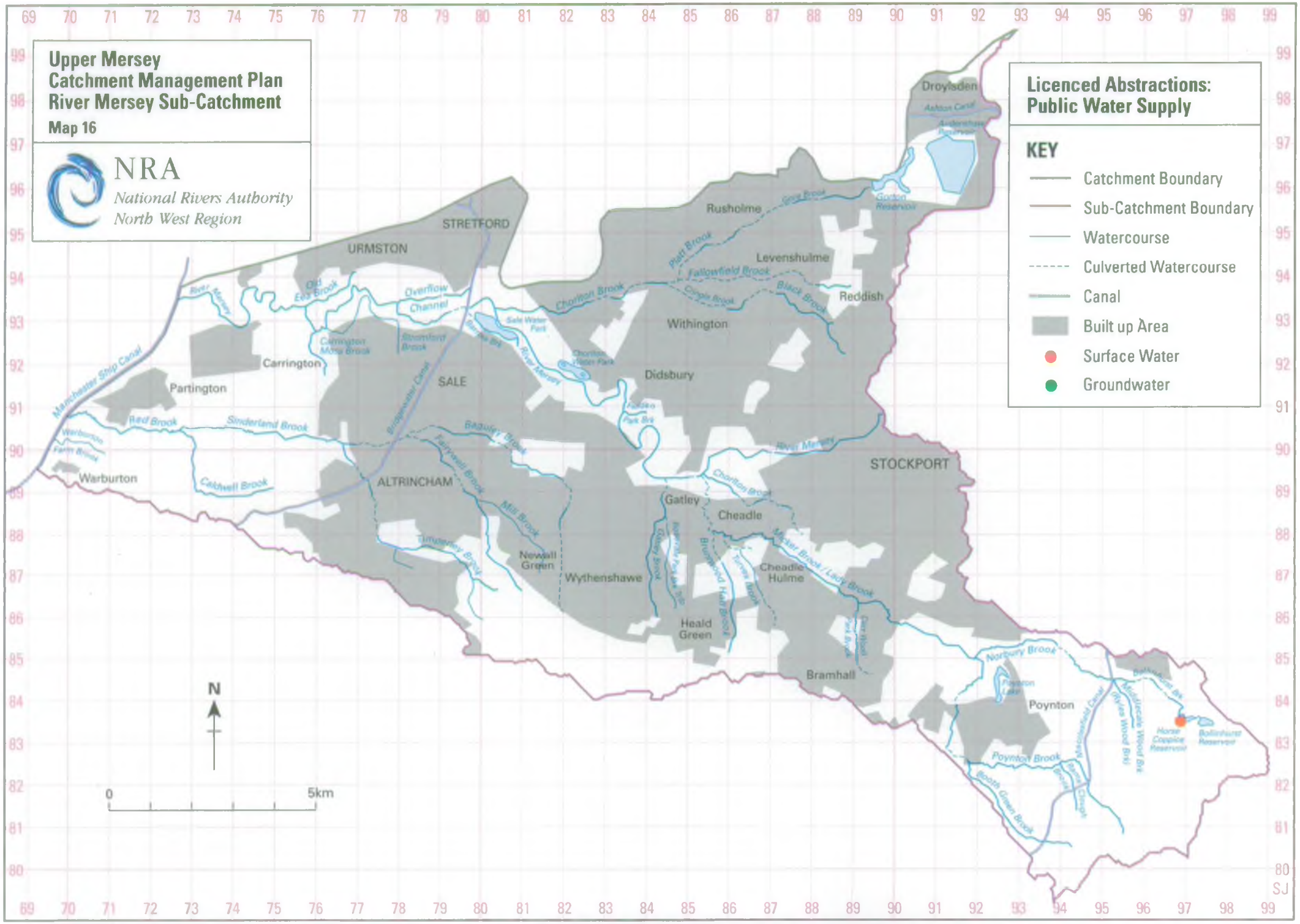
There are no groundwater sources used for Public Water Supply within the catchment. However, the minor aquifers formed by the sandstone units of the Carboniferous era have been exploited to provide private domestic water supplies, particularly in rural areas remote from the mains system. The availability of groundwater from these minor aquifers is very site specific, depending on the local hydrogeology and topography. The majority of these abstractions will be exempt from licensing requirements.

3.4.3 Groundwater Quality

The major Permo-Triassic sandstone aquifer generally contains high quality groundwater, except in the western part of the catchment (Carrington/Partington), where naturally occurring saline groundwaters are known to be present. Elsewhere, it is potentially vulnerable to contamination from past and present land usage, particularly in urban areas, where low permeability drift cover is absent.

Groundwaters associated with the 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.


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 15
NRA
National Rivers Authority
North West Region
Licenced Abstractions:
Industrial and Agricultural
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
INDUSTRIAL ABSTRACTIONS:
Surface Water
Groundwater
Spring Water
AGRICULTURAL ABSTRACTIONS:
Surface Water
Groundwater
Spring Water
N
0
5km
SJ
Droylsden
Ashton Canal
Audenshaw Reservoir
Rusholme
Gore Brook
Carbar Reservoir
Levenshulme
Fallowfield Brook
Platt Brook
Chorlton Brook
Chorlton Brook
Black Brook
Reddish
Withington
STRETFORD
URMSTON
Old Edge Brook
Overflow Channel
Carrington Moss Brook
Sale Water Park
Sale Brk
River Mersey
Didsbury
SALE
Carrington
Partington
Manchester Ship Canal
Bridgewater Canal
Sinderland Brook
Warburton Farm Brook
Warburton
Caldwell Brook
ALTRINCHAM
Baguley Brook
Fallowfield Park Brk
River Mersey
Chorlton Brook
STOCKPORT
Gatley
Cheadle
Mill Brook
Timperley Brook
Newall Green
Wythenshawe
Cheadle Hulme
Bramhall Park Brook
Bramhall Hall Brook
Tunnel Brook
Bramhall Park Brook
Heald Green
Bramhall
Norbury Brook
Poynton
Poynton Brook
Middlecale Wilmslow Brk
Bollinhurst Reservoir
Horse Cloughs Reservoir
Boosts Green Brook


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 16
NRA
National Rivers Authority
North West Region
Licenced Abstractions:
Public Water Supply
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
Surface Water
Groundwater
STRETFORD
URMSTON
Droylsden
Rusholme
Levenshulme
Reddish
Withington
Didsbury
SALE
Carrington
Partington
Warburton
ALTRINCHAM
STOCKPORT
Gatley
Cheadle
Cheadle Hulme
Newall Green
Wythenshawe
Heald Green
Bramhall
Poynton
Manchester Ship Canal
Bridgewater Canal
Macclesfield Canal
River Mersey
Chorlton Brook
Platt Brook
Fallowfield Brook
Black Brook
Red Brook
Sinderland Brook
Baguley Brook
Mill Brook
Cadishead Brook
Norbury Brook
Poynton Brook
Boots Green Brook
Bollinhurst Reservoir
Horse Coppice Reservoir
Gorton Reservoir
Ashton Canal
N
0
5km
SJ

3.5 GROUNDWATER PROTECTION

There is a need to protect both groundwater resources in general and sources in particular from the effects of mans' activities within the Mersey sub-catchment.

The NRA takes a region wide approach to groundwater protection, as set out in the Upper Mersey Catchment Consultation Report. The Authority's "Policy and Practice for the Protection of Groundwater classified 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.

Since there are no groundwater sources used for Public Water Supply within the Mersey sub-catchment, no formal source protection zones have been defined for the catchment.

3.6 CATCHMENT DRAINAGE - FLOODING AND FLOOD ALLEVIATION

3.6.1 General

There is a clear requirement for the provision of effective defence for people and property against flooding from rivers and the sea. Normally flooding is a result of extreme weather conditions, such as high winds or very heavy rainfall.

It is clear that different types of land use, for example, urban areas and pasture land, require different levels of protection.

3.6.2 Local Perspective

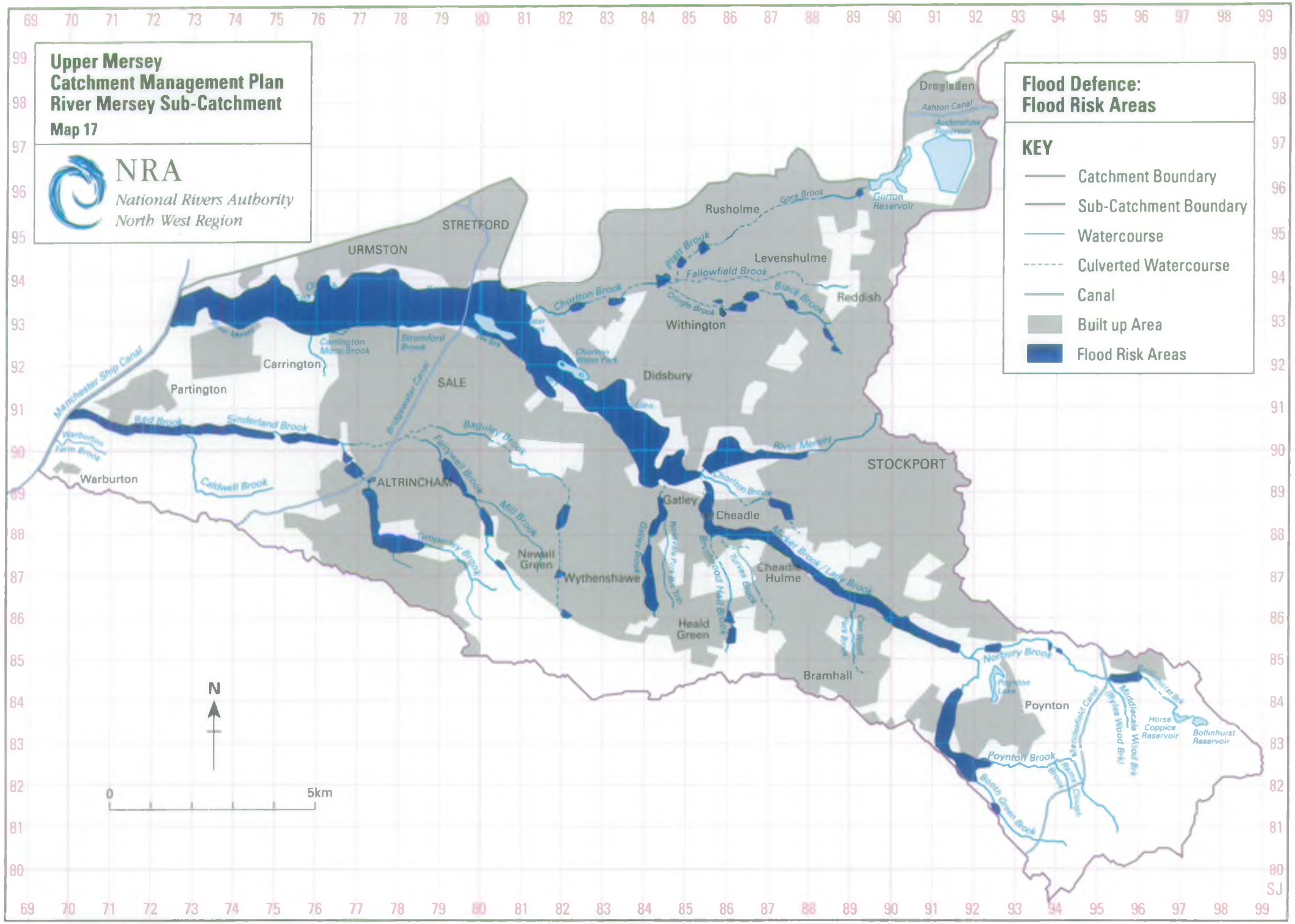
The flow from the River Goyt and the River Tame, which originates from the moors of the Pennines, join in Stockport to form the River Mersey. The Mersey itself is also prone to flooding. However, it reacts much more slowly to rainfall and flood events are not frequent, due to the flood protection provided to the River Mersey flood plain, from Heaton Mersey to Ashton-on-Mersey, which has been protected by extensive flood banks for several hundred years.

In order to further alleviate flooding on the River Mersey, the NRA also operate two Flood Storage Reservoirs (FSRs).

These are Didsbury FSR on the right bank at Withington Golf Club and Sale FSR some 10km. downstream on the left bank at Sale Water Park. A hydraulic computer model is being produced to aid the understanding of the use of these FSR. A dry side weir exists in the right bank at Sale Ees with an overflow channel. This channel was constructed in the last century and diverts flood flow from the Mersey to reduce flow through the Barfoot Aqueduct, which carries the Bridgewater Canal over the river. The flow level at which this structure comes into us and the capacity of the overflow channel requires confirmation by hydraulic computer modelling (**Issue SS17**).

Historically, large floods are known to have occurred on the River Mersey in 1799, 1828 and 1948. The NRA has monitoring points in the catchment where high water levels are recorded. In recent years, of particular note was July 1973, which produced the highest recorded water levels throughout the catchment. Since then, significant events have also occurred in 1983, 1986 and 1991 each time in December, during which both FSRs on the River Mersey operated to prevent property flooding.

There is also a smaller flood storage basin on Timperley Brook, adjacent to the Bridgewater Canal and Balfour Road.


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 17
NRA
National Rivers Authority
North West Region
Flood Defence:
Flood Risk Areas
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
Flood Risk Areas
Droylsden
Ashton Canal
Gorton Reservoir
Rusholme
Gore Brook
Platt Brook
Levenshulme
Fallowfield Brook
Chorlton Brook
Black Brook
Reddish
Withington
Didsbury
STRETFORD
URMSTON
Carrington
Partington
SALE
Manchester Ship Canal
Bridgewater Canal
Sinderland Brook
Bird Brook
Warburton
Warburton Farm Brook
Caldwell Brook
ALTRINCHAM
Timperley Brook
Mill Brook
Newall Green
Wythenshawe
Gatley
Cheadle
Cheadle Hulme
Heald Green
Bramhall
STOCKPORT
River Mersey
Micker Brook / Lyme Brook
Norbury Brook
Poynton
Poynton Brook
North Green Brook
Middlecale Wilmot Brk
Horse Coppice Reservoir
Bollinhurst Reservoir
N
0
5km
SJ

3.6.3 Land Drainage Consents

For certain works which might affect the Regions flood defences, the consent of the NRA may be required.

On designated Main Rivers an NRA consent must be obtained for carrying out any work in, on, under or over watercourses or their banks and within certain distances from the riverside. The NRA will use these powers to control works affecting drainage interests in order to maintain adequate flood protection. In advising and issuing consents the NRA takes into account the potential impact of a proposal on the natural environment. A proposal which has a negative impact on the environment for example, extensive culverting, is unlikely to obtain consent. Local authorities are also required to seek the consent of the NRA before carrying out any works on a non Main River watercourse.

3.6.4 Flood Warning Zones(Map 17: Flood Risk Areas)

There is a Formal Flood Warning Zone on the River Mersey (Zone GM3). Flood Warnings are passed to Greater Manchester Police, who then pass on the warnings to the Local Authorities and properties along the Mersey from Cheadle to Flixton. In order to alleviate flooding, the NRA operate the two Flood Storage Reservoirs (FSR) at Didsbury and Sale.

Regional Telemetry System

There is one river level gauge in the catchment connected to the Regional Telemetry System at Brinksway on the River Mersey in Stockport.

There are two raingauges in the catchment at Denton and Mirwell (Sale), connected to the Regional Telemetry System.

There is telemetry installed at both FSR, which provide river levels and water levels in the basins, when they are operated. The telemetry also includes alarms, which indicate failures, such as mains power or intruders, at either site.

There is also telemetry installed at a debris screen on Cringle Brook at Egerton Road, Withington, which gives an indication of high water levels and whether the water flow through the screen is being restricted by debris.

Historic Flood Events

There are 71 locations in the catchment, where levels have been taken, following high water in the river. These are known as "flood pins", with 25 of them on the River Mersey. On its tributaries, there are a further 11 "flood pins" on Chorlton/Platt/Gore Brook and 14 on Cringle/Black Brook. On Sinderland Brook, Baguley, Timperley and Fairywell Brooks, there are a further 21 "flood pins".

Historically, large floods occurred on the River Mersey in 1799 and 1828, when there was great damage to the Bridgewater Canal. On record, the highest water levels occurred in July 1973, when the Sale Flood Storage Reservoir (FSR) was operated, with the river over 4.2 m higher than its dry weather level at Brinksway (38.07 m AOD). At some locations, historic records exist, which suggest that a flood event in January 1948, exceeded these levels. However, this was prior to the construction of the flood basins. Since both basins have been in operation, the highest water levels have occurred in December 1983 (36.89 m AOD), December 1986(36.75 m AOD) and December 1991 (37.40 m AOD).

On the Sinderland Brook catchment, high water levels were recorded in December 1979 and August 1981.

3.6.5 Operational Maintenance (Map 18: State of the Catchment)

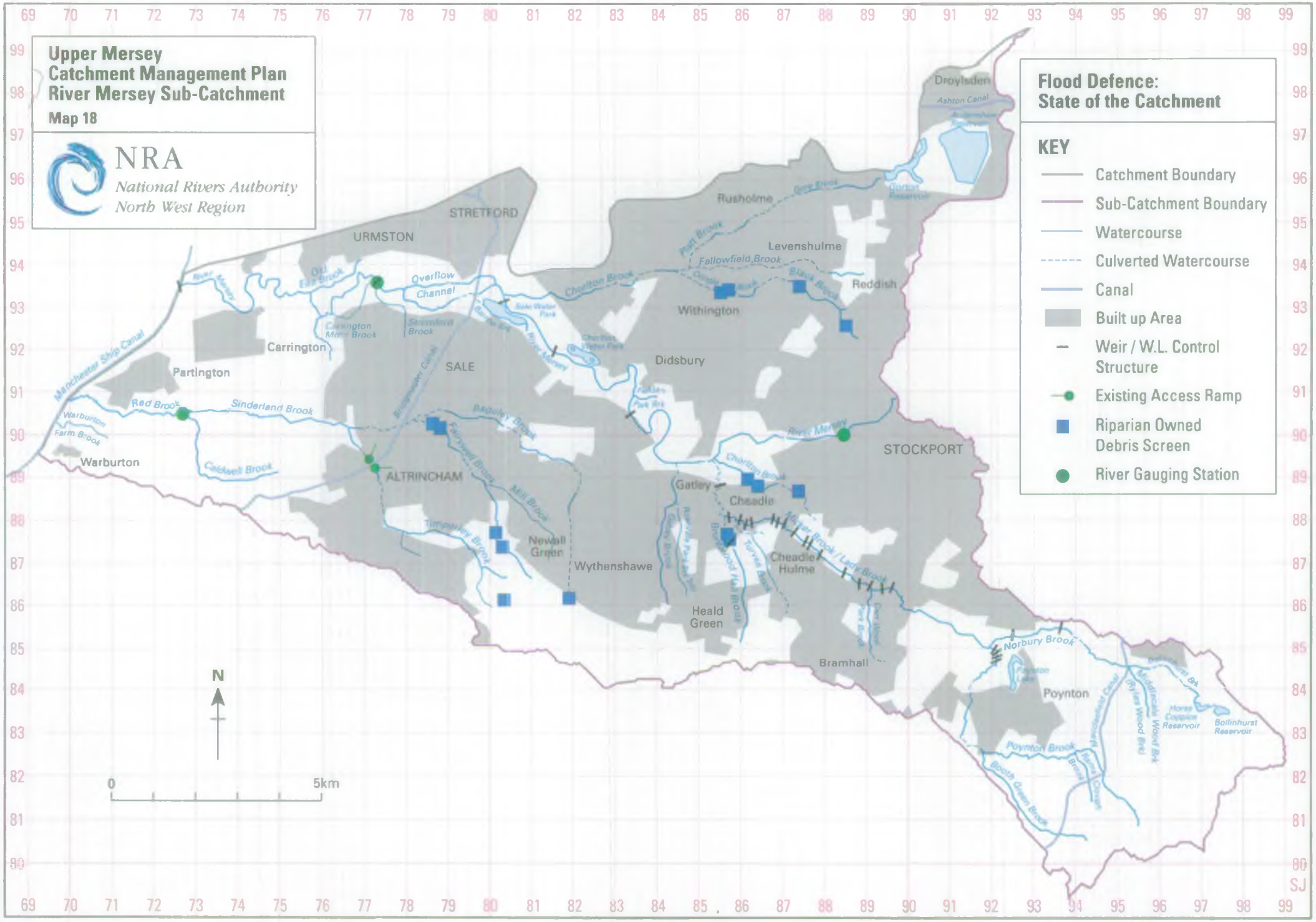
The responsibility for river maintenance and the structural integrity of embankments of any watercourse, within their ownership, principally rests with the riverside landowner, whose ownership as a general rule extends to the centre line of any such river.

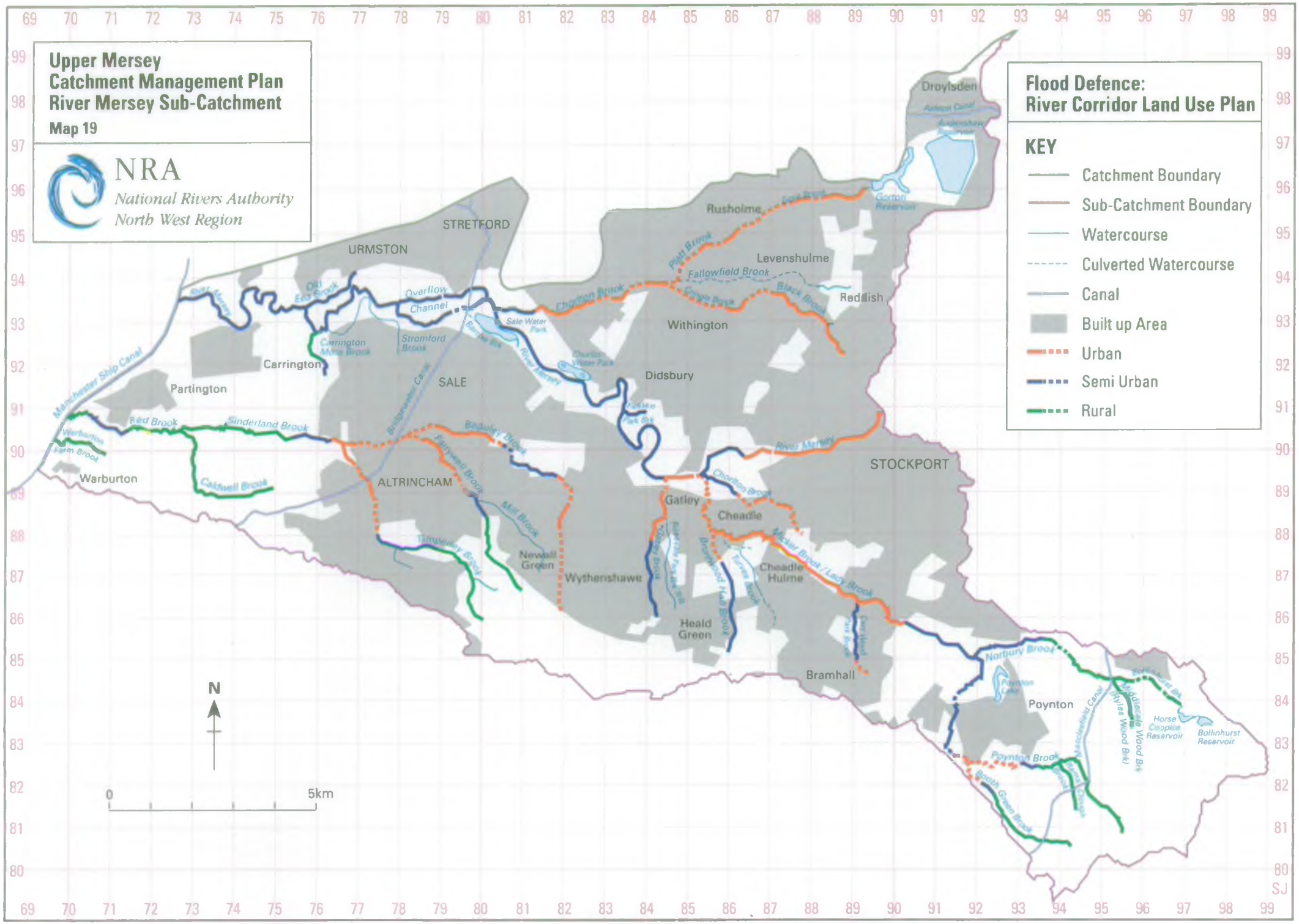
Planned Maintenance

An annual programme of planned maintenance is undertaken. This includes hand maintenance on smaller watercourses, such as weed and grass cutting. Mechanical maintenance of flood banks by flailing takes place several times a year. Where silt and shoals accumulate and have flood defence implications, their removal is generally programmed to take place every few years. Larger individual items of work, such as repairs to flood banks are termed as heavy maintenance and are added to the programme when the need arises.

Maintenance Operation (Map 19: River Corridor Land Use Plan)

The Mersey flows into the Manchester Ship Canal via Irlam Weir. This weir is over 30m wide and can often catch large trees, which due to the size of the structure and flow of water, are dangerous to clear (**Issue SS23**).


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 18
NRA
National Rivers Authority
North West Region
Flood Defence:
State of the Catchment
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
Weir / W.L. Control Structure
Existing Access Ramp
Riparian Owned Debris Screen
River Gauging Station
N
0
5km
SJ
STRETFORD
URMSTON
Droylsden
Ashton Canal
Rusholme
Levenshulme
Reddish
Withington
Didsbury
Carrington
Partington
SALE
ALTRINCHAM
Warburton
STOCKPORT
Gatley
Cheadle
Cheadle Hulme
Newall Green
Wythenshawe
Heald Green
Bramhall
Poynton
Manchester Ship Canal
Red Brook
Sinderland Brook
Warburton Farm Brook
Cadishead Brook
Bridgewater Canal
Overflow Channel
Old Edge Brook
Carrington Moss Brook
Sevenfield Brook
Chorlton Brook
Fallowfield Brook
Bidston Brook
Gorse Brook
Platt Brook
Fallowfield Brook
Baguley Brook
Mill Brook
Timperley Brook
River Mersey
Norbury Brook
Poynton Brook
Booth Green Brook
Middlewich Branch (Bylaws Wood Brk)
Horse Coppice Reservoir
Bollinhurst Reservoir


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 19
NRA
National Rivers Authority
North West Region
Flood Defence:
River Corridor Land Use Plan
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
Urban
Semi Urban
Rural
Droylsden
Rusholme
Levenshulme
Fallowfield Brook
Platt Brook
Chorlton Brook
Black Brook
Reddish
Withington
STRETFORD
URMSTON
Old Eye Brook
Overflow Channel
Sale Water Park
Carrington Moss Brook
Stromford Brook
Carrington
Partington
SALE
Didsbury
Manchester Ship Canal
Red Brook
Sinderland Brook
Warburton Farm Brook
Warburton
Bridgewater Canal
Baguley Brook
Fairywell Brook
Timperley Brook
Mill Brook
Newall Green
ALTRINCHAM
Wythenshawe
Gatley
Cheadle
Heald Green
Cheadle Hulme
Bramhall
STOCKPORT
River Mersey
Chorlton Brook
Micker Brook / Lady Brook
Norbury Brook
Poynton
Poynton Brook
Bonis Green Brook
Horse Coppice Reservoir
Ballinhurst Reservoir
N
0
5km
SJ

Maintenance of the watercourses in residential areas is often complicated by difficulty in access, due to garden fences backing onto the banks, leaving little space for maintenance. These developments were prior to the "maining" of the watercourses and, therefore, at the time of construction, did not come under Byelaw control. This is a particular problem on Baguley Brook, Timperley Brook, Fairywell Brook and Micker Brook (**Issue SCW 4**). A further problem occurs on these brooks, with some residents adjacent to the brooks dumping garden rubbish over the fence and down onto the banks of the watercourses. This rubbish can get washed downstream and cause blockages in culverts and consequently exacerbate existing flooding problems. This problem is also of particular concern on Bruntwood Hall Brook in the area of Daylesford Road, Cheadle, as flooding has occurred in the past due to blocked culverts (**Issue SS9**).

Urban Channel Access

Two access ramps were constructed in 1994 as part of the Urban Channel Access Phase 1 scheme. These were both constructed to improve access to Timperley Brook.

3.6.6 Standards of Service

A system has been developed by the NRA to determine the present standard of service being achieved for flood defence maintenance and all future manned maintenance programmes will be promoted against this background.

The system determines whether present levels of river maintenance have produced a level of protection within target standard, above standard or below. The river system is divided into reaches between 4 - 7 km in length. An assessment is made of the "land use" by considering for each reach the agricultural or urban content within the flood plain and for each element (e.g. road, house, intensive grazing) a score is given. The core is measured by a single unit called a "House Equivalent" and by the score achieved, the reach is placed into one of several land use bands, which determines the cost beneficial level of maintenance to be applied.

3.6.7 Capital Investment

The prioritisation, feasibility studies, design and construction of capital investment projects will be carried out against a background of detailed project appraisal, to achieve cost effective flood defences for the protection of people and property, against flooding, from the rivers and the sea, to a standard appropriate to land use.

3.6.8 Investigations and Capital Works

Construction of channel improvements and debris screens on Chorlton Brook, Fallowfield is expected to commence in 1995 (**Issue SS14**). It is programmed that these will be completed by 1998.

Over the years, substantial lengths of the banks and flood banks on the channelised stretch of the River Mersey have been worn away by slippage and erosion. They are now in need of repair to strengthen and rehabilitate them (**Issue SS15**). An investigation to study the future management of the repair of these flood banks is due to commence in Spring 1996. This will investigate the viability of both future capital and maintenance works. If capital works are recommended, then the River Mersey Rehabilitation Schemes is programmed in the North West Region Long Term Plan for the years 1997 to 2001.

There is a weir at Northenden, which used to feed a former mill, and a rubble weir at Sale Ees, both of which now help to protect the banks of the River Mersey from erosion. Over the years, deterioration to the two structures has occurred and this will be investigated in the River Mersey Rehabilitation Scheme (**Issue SS16**).

A feasibility study to investigate flooding problems and possible Flood Defence works on Chorlton Brook in Cheadle is being undertaken by a consultant, Lewin, Fryer & Partners (**Issue SS10**). The study is expected to be complete in Summer 1995 and, if a cost beneficial solution exists, capital works are programmed in the North West Region Long Term Plan for the years 1999 to 2000.

An investigation into flooding problems on Baguley Brook in Altrincham is programmed to be undertaken in 1995/96 (**Issue SS26**). If a cost beneficial solution exists, capital works are programmed in the North West Region Long Term Plan for 2001/02.

An investigation into flooding problems on Gatley Brook, Gatley is programmed to be undertaken in 1997/98 (**Issue SS12**). If a cost beneficial solution exists, capital works are programmed in the North West Region Long Term Plan for 2002/03.

An investigation into flooding problems on Fairywell Brook, Altrincham is programmed to be undertaken in 1998/99 (**Issue SS25**). If a cost beneficial solution exists, capital works are programmed in the North West Region Long Term Plan for 2002/03

An investigation into flooding problems on Carrwood Park Brook at Robins Lane, Bramhall is required (**Issue SS7**). If a cost beneficial solution exists, capital works are programmed in the North West Region Long Term Plan for 2002/03.

An investigation into flooding problems on Timperley Brook, Altrincham is required (**Issue SS28**). If a cost beneficial solution exists, capital works are programmed in the North West Region Long Term Plan for 2003/04.

An investigation into flooding problems on the River Mersey at Flixton Bridge is required (**Issue SS21**). If a cost beneficial solution exists, capital works are programmed in the North West Region Long Term Plan for 2003/04.

An investigation into flooding problems on Bruntwood Hall Brook, Cheadle is required (**Issue SS8**). If a cost beneficial solution exists, capital works are programmed in the North West Region Long Term Plan for 2004/05.

An investigation into flooding problems at various locations on Micker Brook is required. The locations will include Bramhall Bridge, Greenhall Bridge and Airedale Close in the Bramhall and Cheadle areas (**Issue SS5**). If a cost beneficial solution exists, capital works are programmed in the North West Region Long Term Plan for 2004/05.

A review of several perceived flooding problems in the catchment will be undertaken in 1995/96 to ascertain whether further investigation should take place (**Issue SS1b**).

Location	Description of flooding problem
River Mersey, Waterside Hotel	A hotel complex, constructed at a low level is affected and also erosion on the opposite bank has exposed a gas pipeline.
Sinderland Brook, Woodhouses, Sale	Inadequate capacity channel affects residential properties.
Booth Green Brook, Hope Green	A reduction of channel capacity through silting up and a weir.
Norbury Brook, Brookside Garden Centre.	Several low bridges and an inadequate capacity channel affects a garden centre.

3.6.9 Ordinary Watercourses

A flooding problem exists due to several culverts on Poynton Park Brook, Poynton, which are prone to blockage and affects residential property and Park Lane (**Issue SS1a**).

In the Mersey sub-catchment, there are many ordinary watercourses, which are culverted. Historical records of the location and direction of these are difficult to find, for example Brownley Brook, Fallowfield Brook and Mill Brook. Consequently, when enquiries are made regarding these watercourses, for instance in connection with development proposals, it is impossible to give accurate information on the catchments and capacities.

3.7 WASTE DISPOSAL

3.7.1 General

The majority of the waste generated within the UK is disposed of via landfill sites. The wastes that pose the most threat to the water environment are those that degrade or produce water soluble products. All rivers and groundwaters can be placed at risk from landfill sites. However, groundwater tends to be the most vulnerable, due largely to the practice of infilling mineral extractions below ground level.

A Waste Management Licence (WML) is required from the Waste Regulation Authority (WRA) for the storage treatment, or disposal of controlled waste on land.

The disposal of waste onto land is regulated under Part II of the Environmental Protection Act 1990. The relevant provisions for licensing of waste activities were implemented on 1st May 1994. Before this date, licensing of waste operations was required under Part I of the Control of Pollution Act 1974, which was implemented through Regulations in 1976. Prior to this date, controls over waste activities were indirect and included the planning and Public Health powers exercised by the local authorities. Hence, disposal of waste was largely uncontrolled and therefore, knowledge of what has been disposed and where, is incomplete.

A WML sets out the requirements for the detailed operation of the site and includes measures to be taken, by the operator, to safeguard and protect the environment. For a non-inert landfill such measures may include, an engineered liner to contain any leachates which may e produced within a landfill and measures for collecting and disposing of these leachates. Licence holders are generally required to monitor groundwaters, surface waters and leachate to ensure that landfill sites are operating to the expected standards.

It should be noted that many waste management operations, other than landfill, also require a WML. These activities include transfer stations, incinerators, metal recycling facilities, and waste storage and treatment facilities. For such sites, licences may require impermeable surfacing, bunding of tanks and the appropriate disposal of contaminated surface water run-off.

For currently licensed sites, the WRA can continue to require the environmental management and monitoring of the site until it considers the site is no longer likely to cause any pollution of the environment, and the licence can be surrendered.

3.7.2 Local Perspective

There are many current waste management operations within this catchment. The number of each activity is listed below:

Inert Landfill	15
Non Inert Landfill	2
Waste Transfer Station	19
Scrapyard	5
Storage Facility	4
Civic Amenity (Household Waste Disposal Sites)	13
Waste Treatment	3
Incinerator	1

The NRA as close links with the WRAs once the licence has been issued and the site is operational. They will also be involved in discussions regarding the surrender of a licence and the necessary issue of a Certificate of Completion, for any sites within this catchment.

A WML sets out the requirements for the operation of the site and includes measures to be taken by the operator, to safeguard and protect the environment for example lining and capping requirements, bunding of storage tanks.

3.7.3 Environmental Objectives

- To ensure waste management activities do not compromise water quality or water resources, and that they are undertaken in accordance with advice given in the NRA's Policy and Practice for the protection of Groundwater document.

3.7.4 Environmental Requirements

Water Quality

- All sites should comply with EC Directives on dangerous substances discharged to surface and groundwaters.
- The Nra Groundwater Protection Policy should be implemented.
- No sites should cause pollution of the water environment.

Water Quantity

- No reduction in the availability of water resources.
- Minimise the loss of recharge to aquifers.

Physical Features

- Restore all sites to an acceptable environmental standard, taking into account, or consideration, the opportunities for conservation recreation and amenity.
- Features of the water environment which are of ecological or landscape value should be safeguarded.
- Ensure that any necessary flood defence works should be carried out in an environmentally sensitive manner.
- The integrity of the river channel adjacent to the landfill sites should be maintained.

3.8 CONTAMINATED LAND

3.8.1 General

In most areas of industrial development, sites of contaminated land are found. The North West Region in particular has suffered in this respect, due to its significant role in the Industrial Revolution. Due to the expansion of industry within the towns and cities, many rural areas were also utilised, at that time, for the disposal of the waste products.

Significant areas of land have been contaminated as a result of:

Chemical Works
Tanneries
Gas Works
Oil Processing
Engineering Works
Metal Refining Works
Mining/Mines
Closed Landfill Sites
Textile Industry

Historically, poor site management, housekeeping and operation, frequently resulted in land becoming contaminated. In recent times, the awareness of potential environmental impact of activities as improved this situation.

The NRA is a consultee of the Planning Authorities under the Town and Country Planning Acts. The NRA will advise developers of common land sites on the vulnerability and sensitivity of the site in relation to groundwaters and surface waters. The implications of the contamination present will be considered and any required remediation highlighted. The NRA encourages consultation on site reclamation and development at an early stage.

Where a site is known to be causing an impact on the water environment, the NRA will seek improvement measures from the landowners or occupiers in order to alleviate the situation.

A significant concern is that the full extent of contaminated land sites both locally and nationally has not been identified. This will be a major challenge for the future. The Environment Act 1995 sets out provisions and duties for contaminated land which will be carried out by the Agency and the local authorities. The Environment Act 1995 also provided for guidance to be issued to define what constitutes contaminated land. Risk of water pollution will be included as a factor in the guidance on the identification of contaminated land.

The Act gives to local authorities a new duty, to identify contaminated sites and empowers them to serve remediation notices. The Environment Agency will provide guidance and will deal with 'Special Sites' of particular complexity or difficulty.

Remediation of contaminated land, in general, costs very substantial sums of money. Although polluters or landowners may be found liable and made to pay, overall progress is likely to be influenced by government policy, and in particular by the availability of funding. Many contaminated sites are in public ownership as a result of abandonment. Often the feasibility of remediation is influenced by the added value conferred on land by remediation and redevelopment. Where a site is not suitable for a high value after use the economics and securing of funding become more difficult.

Whilst acknowledging the economic issues, the NRA will week to achieve the improvements necessary to prevent unacceptable risks of water pollution from contaminated land.

3.8.2 Local Perspective

Historically, the industries associated with this catchment have predominantly been the textile industry, with some paper mills, chemical works and dye manufacturers.

3.8.3 Objectives

- The risk of land becoming contaminated from current and future activities should be minimised.
- Advise on re-development of sites and promotion of a reduction in the risk of pollution to controlled waters should be undertaken.
- There should be no detrimental impact through re-development.

3.8.4 Environmental Requirements

Water Quality

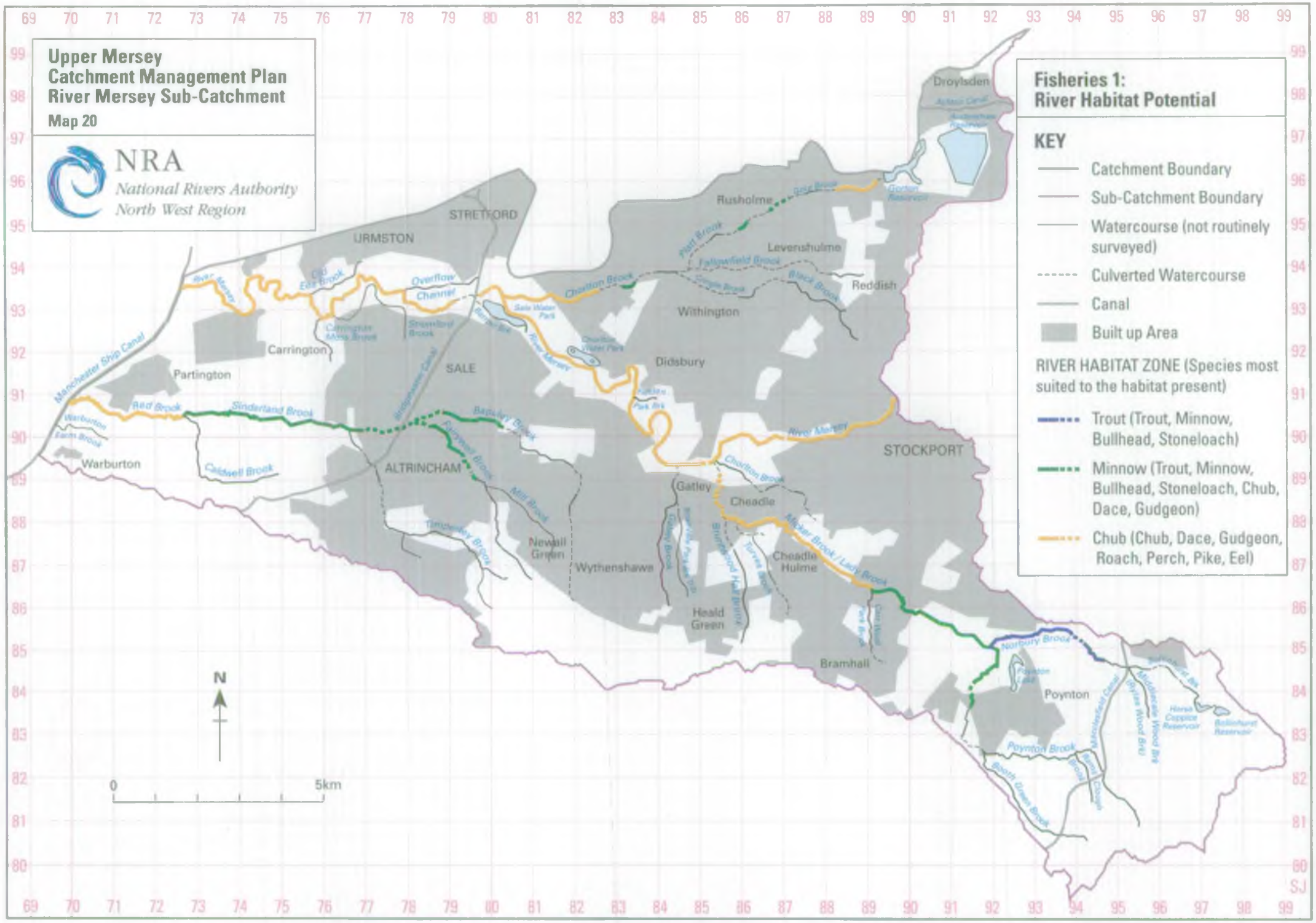
- All sites should comply with EC Directives on dangerous substances discharged to surface and groundwaters.
- The NRA Groundwater Protection Policy should be implemented.
- No sites should cause pollution of the water environment.

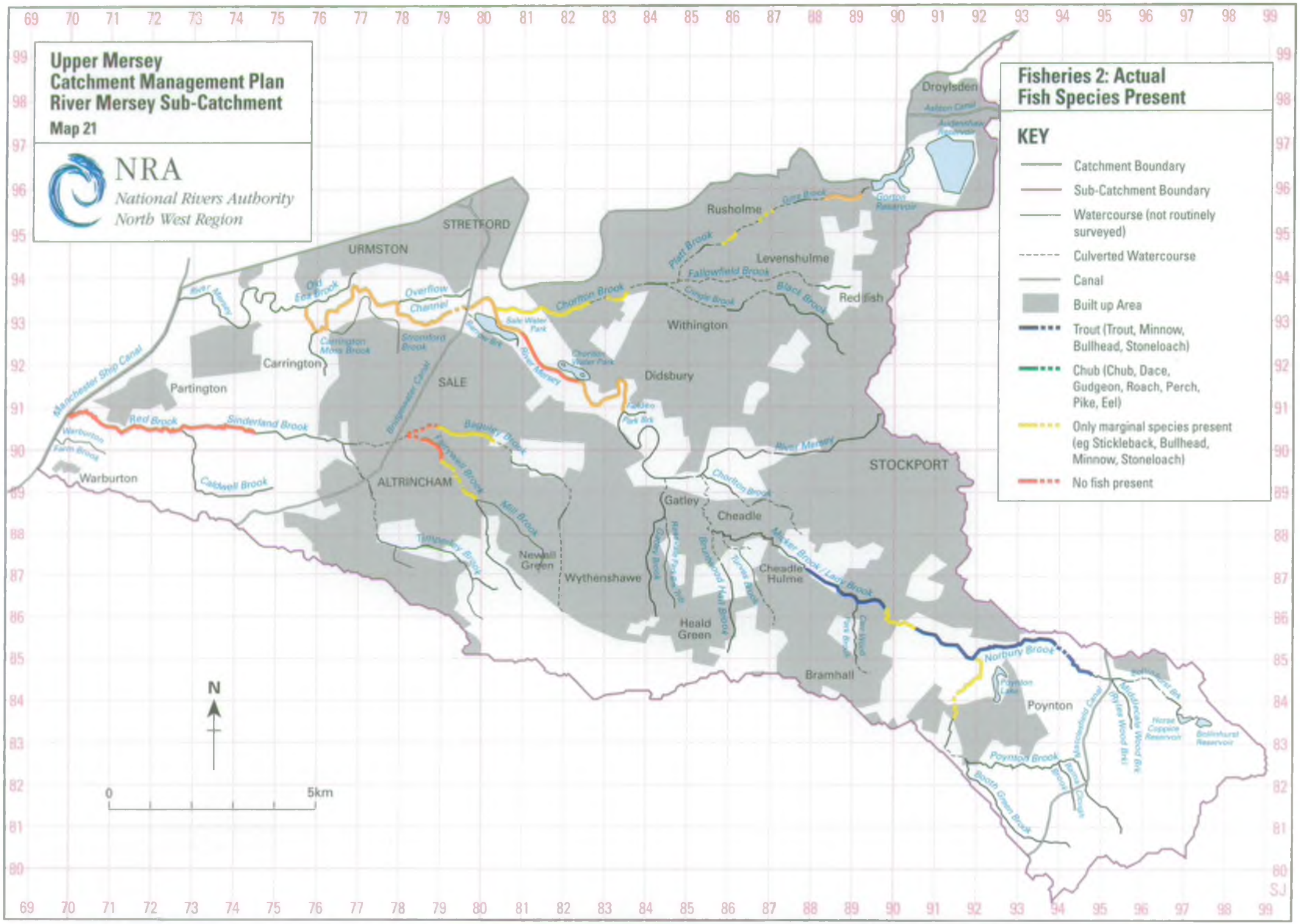
Water Quantity

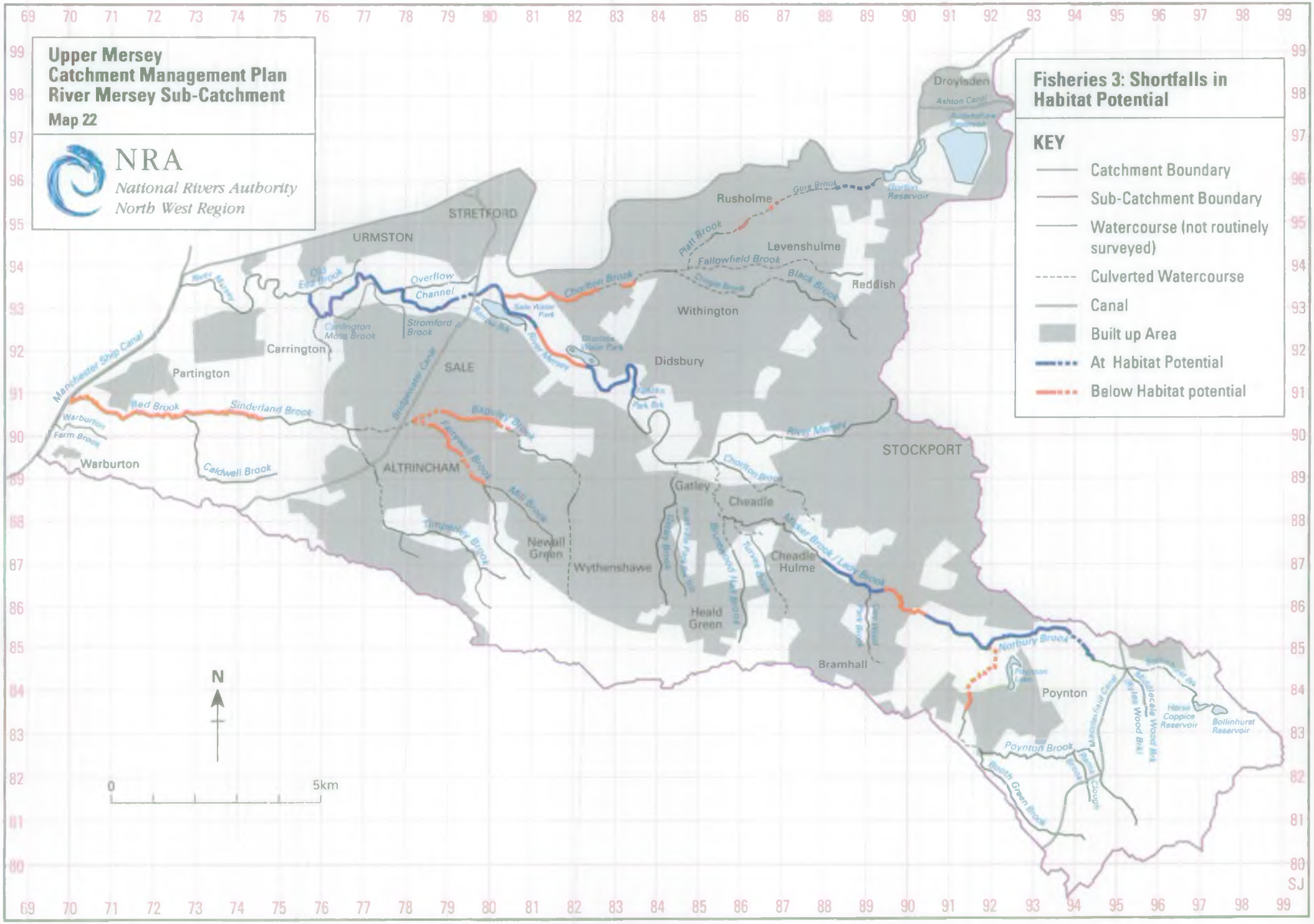
- No reduction in the availability of water resources.

Physical Features

- All sites should be reclaimed to an acceptable environmental standard, taking into account the opportunities for conservation, recreation and amenity.


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 20
NRA
National Rivers Authority
North West Region
Fisheries 1:
River Habitat Potential
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse (not routinely surveyed)
Culverted Watercourse
Canal
Built up Area
RIVER HABITAT ZONE (Species most suited to the habitat present)
Trout (Trout, Minnow, Bullhead, Stoneloach)
Minnow (Trout, Minnow, Bullhead, Stoneloach, Chub, Dace, Gudgeon)
Chub (Chub, Dace, Gudgeon, Roach, Perch, Pike, Eel)
Droylsden
Rusholme
Levenshulme
Reddish
Withington
Didsbury
STRETFORD
URMSTON
Carrington
Partington
SALE
ALTRINCHAM
Warburton
STOCKPORT
Gatley
Cheadle
Cheadle Hulme
Newall Green
Wythenshawe
Heald Green
Bramhall
Poynton
Manchester Ship Canal
River Mersey
Red Brook
Sinderland Brook
Baguley Brook
Ashton Brook
Mill Brook
Timperley Brook
Caldwell Brook
Chorlton Brook
Micker Brook / Lady Brook
Norbury Brook
Poynton Brook
Bosts Green Brook
Bridgewater Canal
Manchester Canal
Gorton Reservoir
Sale Water Park
Chorlton Water Park
Fallowfield Brook
Black Brook
Poynton Lake
Bollington Reservoir
N
0
5km
SJ


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 21
NRA
National Rivers Authority
North West Region
Fisheries 2: Actual
Fish Species Present
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse (not routinely surveyed)
Culverted Watercourse
Canal
Built up Area
Trout (Trout, Minnow, Bullhead, Stoneloach)
Chub (Chub, Dace, Gudgeon, Roach, Perch, Pike, Eel)
Only marginal species present (eg Stickleback, Bullhead, Minnow, Stoneloach)
No fish present
Droylsden
Rusholme
Levenshulme
Reddish
Withington
Didsbury
STRETFORD
URMSTON
Carrington
Partington
SALE
Warburton
ALTRINCHAM
Gatley
Cheadle
STOCKPORT
Newall Green
Wythenshawe
Heald Green
Cheadle Hulme
Bramhall
Poynton
Manchester Ship Canal
River Mersey
Red Brook
Sinderland Brook
Bridgewater Canal
Baguley Brook
Flixton Brook
Mill Brook
Timperley Brook
Cadwell Brook
Old Eea Brook
Overflow Channel
Carrington Moss Brook
Stretford Brook
Sale Water Park
Chorlton Water Park
Chorlton Brook
Platt Brook
Fallowfield Brook
Cringle Brook
Black Brook
Sugg Brook
Gorton Reservoir
Ashton Canal
Audenshaw Reservoir
Mauldeth Brook
Mauldeth Brook / Lady Brook
Norbury Brook
Poynton Lake
Poynton Brook
Booth Green Brook
Macclesfield Canal
Bollinhurst Bk
Bollinhurst Reservoir
Horse Coppice Reservoir
N
0
5km
SJ


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 22
NRA
National Rivers Authority
North West Region
Fisheries 3: Shortfalls in Habitat Potential
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse (not routinely surveyed)
Culverted Watercourse
Canal
Built up Area
At Habitat Potential
Below Habitat potential
STRETFORD
URMSTON
Carrington
Partington
Warburton
SALE
ALTRINCHAM
Newall Green
Wythenshawe
Gatley
Cheadle
Cheadle Hulme
Heald Green
Bramhall
STOCKPORT
Poynton
Withington
Didsbury
Levenshulme
Reddish
Rusholme
Droylsden
Manchester Ship Canal
Red Brook
Sinderland Brook
Warburton Farm Brook
Caldwell Brook
Bridgewater Canal
Timperley Brook
Mill Brook
Baguley Brook
Fallowfield Brook
Stromford Brook
Carrington Moss Brook
Old Eccles Brook
Overflow Channel
River Mersey
Chorlton Brook
Platt Brook
Fallowfield Brook
Black Brook
Gore Brook
Ashton Canal
Norbury Brook
Poynton Brook
Bonis Green Brook
Micker Brook / Lady Brook
Bollinhurst Reservoir
Horse Coppice Reservoir
N
0
5km
SJ

3.9 FISHERIES

3.9.1 General.

This use covers game and coarse fisheries, that is, the development and maintenance of breeding populations of salmonid and cyprinid fish species.

The NRA has duties to maintain, improve and develop fisheries and to further the conservation of fish species. Fish populations are effected 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.

3.9.2 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 with the use of three coloured maps. **Map 20** indicate the habitat potential or 'expected species' according to a subjective classification of habitat type. **Map 21** indicates the actual species present, from the results of the survey. **Map 22** shows the shortfalls in habitat potential, as far as species composition is concerned. The data collected on fish populations can be used to help classify and establish objectives for the river.

Sampling was restricted within the catchment due to access problems on the smaller tributaries and due to the large size of the River Mersey. The habitats within Mersey sub-catchment range from those suitable for trout and minnow, especially in the smaller tributaries, to good chub habitats in the River Mersey.

Results are summarised below:-

- Populations of brown trout were recorded in Norbury Brook and downstream in Lady Brook. Norbury brook is stocked periodically by a local angling club.

- Poynton Brook only contained minor coarse fish species such as bullhead, stoneloach and sticklebacks.

- Very small numbers of coarse fish were recorded in Gore Brook associated with the outfall from Debdale Reservoir. Further downstream, and in Chorlton Brook, only sticklebacks were recorded.

- In the upstream reaches of Baguley Brook and Fairywell Brook only sticklebacks were recorded. Within the lower reaches of these Brooks, and in Sinderland Brook (Red Brook) no fish were recorded at all.

The River Mersey has seen improvements in water quality over the last few years and hence there has been an improvement in fish populations. This has been encouraged by the stocking of chub, dace and roach from the NRA hatchery at Leyland.

Fish passes have been included in the plans to renovate the weirs at Northenden and Sale Ees. This will enable the upstream migration of the fish present to help their spread and spawning success.

3.9.3 Environmental Objectives.

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

3.9.4 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 non statutory RQOs and SWQOs future, whichever is appropriate.

- The remaining designated river stretches should be maintained within the limit of pollutants as specified in the same EC Directive, but for coarse fish species, or by non-statutory RQOs and future SWQOs, whichever is appropriate.

Water Quantity:

- A flow pattern is required where the monthly average reflects the natural flow conditions in the river.

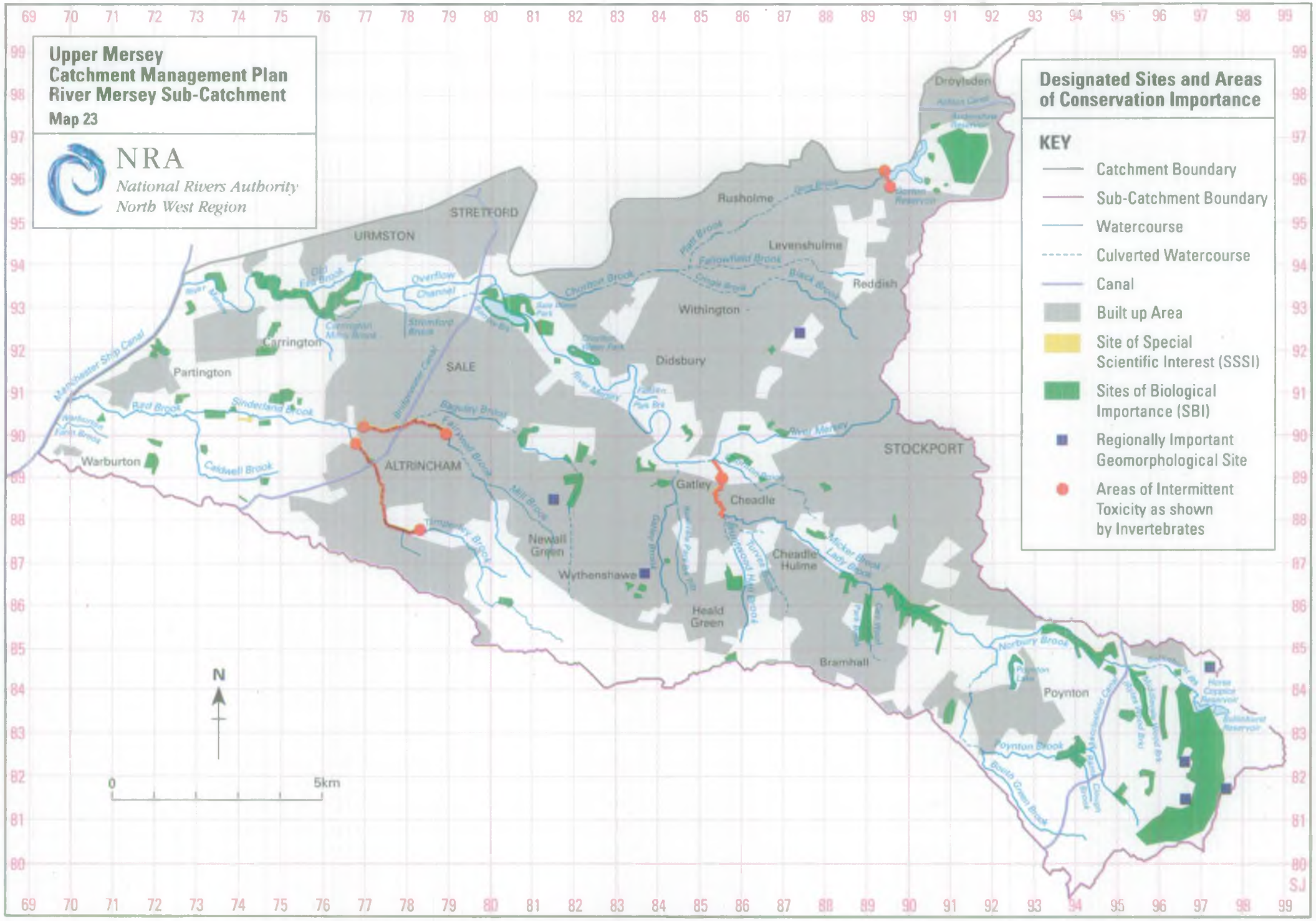
Physical features:

- A diversity of natural river features are required for example, riffle/pool sequences, weed beds for feeding and spawning. It is necessary to ensure that a suitable variety of habitats are provided, to allow the maximum production and long term security of the fish population.

- The presence of bankside vegetation is required to provide adequate shade, cover and refuge.

- River maintenance operations must have a minimal impact on fish populations and enhance river habitat diversity where practical.

- Access by fish to all sections of river is necessary to sustain a viable population. The passage over or through obstructions is required.


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 23
NRA
National Rivers Authority
North West Region
Designated Sites and Areas of Conservation Importance
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
Site of Special Scientific Interest (SSSI)
Sites of Biological Importance (SBI)
Regionally Important Geomorphological Site
Areas of Intermittent Toxicity as shown by Invertebrates
N
0
5km
SJ
Droylsden
Rusholme
Levenshulme
Reddish
Withington
Didsbury
STRETFORD
URMSTON
Carrington
Partington
SALE
ALTRINCHAM
Warburton
STOCKPORT
Gatley
Cheadle
Newall Green
Wythenshawe
Heald Green
Cheadle Hulme
Bramhall
Poynton
Manchester Ship Canal
Bird Brook
Sinderland Brook
Caldwell Brook
Bridgewater Canal
River Mersey
Bagslay Brook
Fallowfield Brook
Mill Brook
Timperley Brook
Chorlton Brook
Platt Brook
Fallowfield Brook
Black Brook
Micker Brook
Lady Brook
Norbury Brook
Poynton Brook
Bluith Green Brook
Macclesfield Canal
Bollington Reservoir

3.10 CONSERVATION

3.10.1 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 the rivers and the water environment.

3.10.2 Local perspective (Map 23)

The Mersey Valley is a large, fairly flat corridor with open spaces linked by woodland and scrub. Land-use in the catchment is largely industrial and urban with pockets of agricultural land.

The conservation value of the River Mersey and its tributaries have been diminished to a large extent by pressure for urban development and associated road schemes, major river works and the need to cope with large volumes of water during flood conditions. The proposed Metro-link extension will have an impact on the Mersey Valley and its tributaries due to various crossings etc. **(Issue SCW2)** The low-lying land adjacent to the Mersey itself is protected by substantial flood banks of fairly uniform appearance. The banks and associated access berms have only sparse tree and shrub cover and little marginal habitat. Where the river has not been channelised, the geomorphological and ecological interest is greatly increased. High flows in the river are diverted to flood storage basins, which have been constructed at Sale and Didsbury. Careful management of these sites ensure that conservation interest is optimised wherever possible whilst satisfying the need to handle large volumes of water in an emergency.

Aesthetic appearance of long sections of the river is impaired by large quantities of sewage litter caught in bankside vegetation. This is also a problem along Sinderland Brook in the vicinity of Altrincham STW. **(Issue SS40)**.

The tributaries vary in their conservation interest. Poynton and Norbury Brooks in the south east of the catchment are of high conservation value retaining their wooded corridors. Downstream, where the streams form Micker Brook, bank works have altered the flow regime and conservation interest is reduced. Of least conservation interest is the Chorlton/Platt/Gore Brook, to the north-east of the catchment, which has been extensively culverted.

To the west of the catchment are Baguley Brook, Fairywell Brook and Timperley Brook which feed into Sinderland Brook. All are generally uniform in character and extensively channelised as they pass through heavily developed areas **(Issue SCW4)**. There are scattered open spaces and semi-rural areas where the river corridors are more natural.

Also of limited conservation value in the catchment are the corridors of the canals; the Bridgewater Canal and the Manchester Ship Canal.

The Mersey Valley contains a number of designated conservation areas. Brookheys Covert, adjacent to Sinderland Brook, has been designated as an SSSI and covers an area of approximately 2.35 hectares. The oak/hazel/ash woodland found here is uncommon in Greater Manchester and the range of woodland and wetland habitats are of particular interest close to a densely populated area.

There are 58 SBIs scattered across the catchment mostly associated with river corridor and/or wetland habitats, particularly along Micker Brook and its tributaries and also along actively meandering sections of the River Mersey, which require protection (**Issue SS5**). Ten RIGS have been identified in the catchment although none are associated with the river channel.

Geomorphological processes in the Mersey Valley have led to a range of physical features including eroding banks and depositional features seen along the river. Extensive meandering and erosion of the river bed continues as the river adjusts to conditions, following construction of the Manchester Ship Canal and the subsequent change in regime. There is a conflict between the SBI along the natural river corridor of the Mersey and the impacts of tipping and bank stabilisation by landowners (**Issue SS22**). The geomorphology of the catchment has also been affected by a number of weirs, such as Northenden weir and Ashton weir, which assist the stabilisation of the existing river channel.

Water voles, believed to be a nationally declining species, are present in the catchment. Birds of particular interest include sandmartins, which nest in exposed earth cliffs, such as those along an actively eroding sections of the river downstream of Ashton on Mersey and close to Cheadle Bridge (**Issue SS11**). Kingfishers have been seen along the Mersey and its tributaries. Protection of these birds and their habitats is a key issue in this catchment.

Mink, which is a non-native species, are particularly common in the Mersey Valley. They can be a threat to small mammals, birds and fish.

Pest species are an ever increasing problem along the River Mersey and its tributaries. These include Giant Hogweed, particularly at Ashton on Mersey (**Issue SS18**), Japanese Knotweed and Himalayan Balsam. The aquatic plant Crassula has also been identified at two locations, adjacent to the Mersey and Timperley Brook, (**Issue SS27**) in the catchment and it is important that its spread is prevented.

Opportunities for enhancement across the Mersey Valley exist, for example, through development control and possibly through incentive schemes such as Countryside Stewardship, to provide buffer zones of natural habitat along tributaries, particularly those of the Manchester Ship Canal.

Mainly through reactive work for Flood Defence, 40% of the River Mersey, approximately 30% of the tributaries and 30% of the Manchester Ship Canal tributaries have had their river corridors surveyed. Further survey work will continue to indicate areas where existing habitats require sensitive treatment and enhancement would improve the conservation value of the river corridor.

3.10.3 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:

- The retention of existing features of conservation interest.
- Actively promoting the enhancement and restoration 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.

3.10.4 Environmental Requirements

Water Quality:

- Water quality should not deteriorate to a level such that sites of high local conservation value lose their general aquatic interest.
- Water quality improvement at some sites would enhance the existing conservation value.

Water Quantity:

- A variable flow pattern is required, where the monthly average flow reflects the established or natural flow conditions in the river.
- Provide hydraulic continuity between the river and its flood plain is required where appropriate. The water is 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 be allowed to naturally cleanse the river channel.

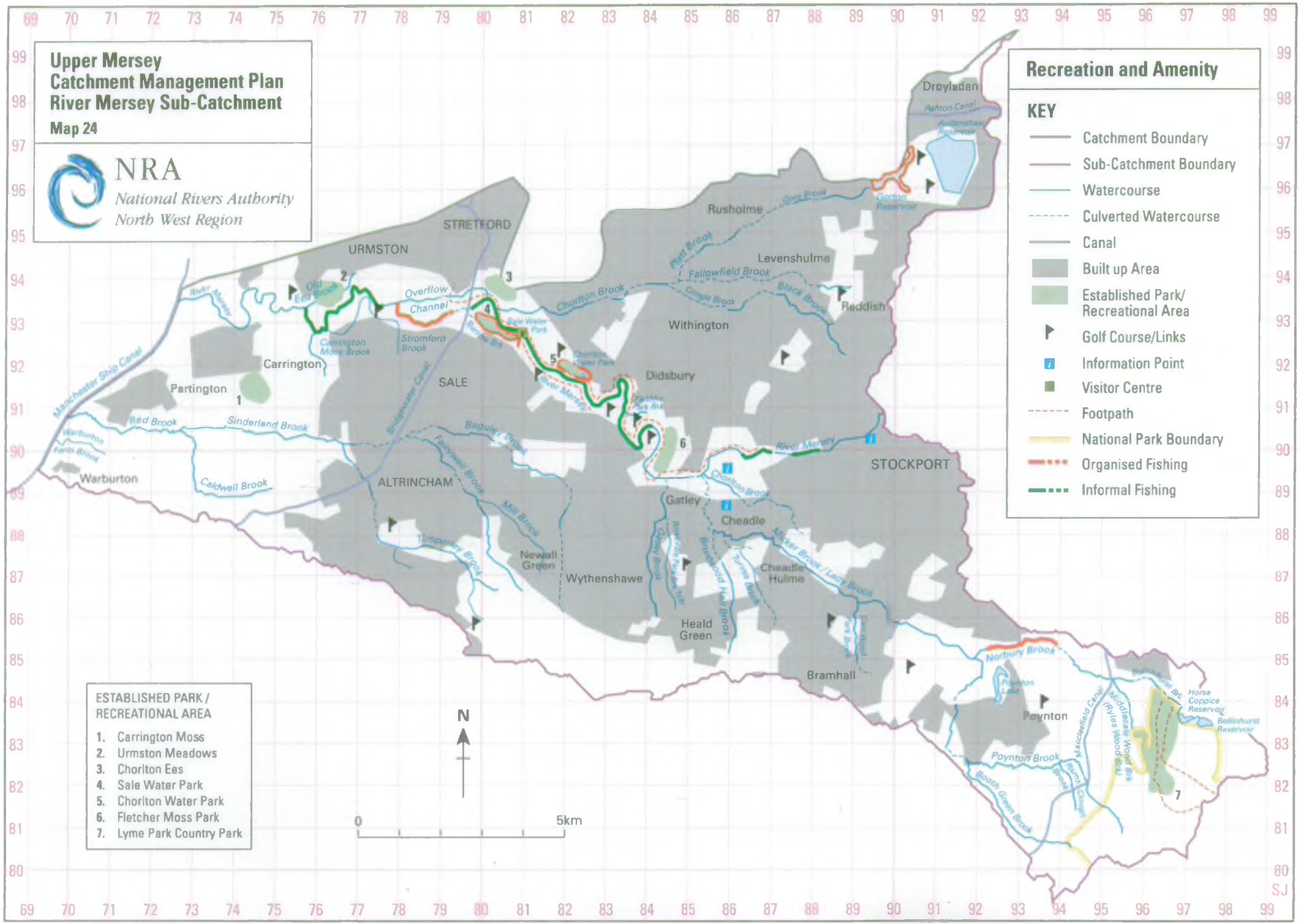
Physical Features:

- The conservation 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 and marginal (water's edge)vegetation is essential.

- It is necessary to protect and enhance a diversity of river corridor habitats, including marsh, ponds, fringe/overhanging vegetation, bankside trees and hedges, old channels, flood plain habitats, species rich bank vegetation, uncultivated buffer strips, grassland and woodland. Also, the conservation of the features which give rise to, or contribute towards the specific features of the designated conservation areas should be protected.

- The channel cross section needs to be appropriate for the river flow pattern.

- Assistance with the promotion of less intensive farming in river corridors through incentives such as Countryside Stewardship scheme needs to be provided.


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 24
NRA
National Rivers Authority
North West Region
Recreation and Amenity
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
Established Park/ Recreational Area
Golf Course/Links
Information Point
Visitor Centre
Footpath
National Park Boundary
Organised Fishing
Informal Fishing
ESTABLISHED PARK / RECREATIONAL AREA
1. Carrington Moss
2. Urmston Meadows
3. Chorlton Ees
4. Sale Water Park
5. Chorlton Water Park
6. Fletcher Moss Park
7. Lyme Park Country Park
N
0
5km
Droylsden
Ashton Canal
Rusholme
Levenshulme
Reddish
Withington
STRETFORD
URMSTON
Carrington
Partington
SALE
Didsbury
Warburton
ALTRINCHAM
STOCKPORT
Gatley
Cheadle
Newall Green
Wythenshawe
Heald Green
Cheadle Hulme
Bramhall
Poynton
Manchester Ship Canal
River Mersey
Red Brook
Sinderland Brook
Caldwell Brook
Bridgewater Canal
Stromford Brook
Carrington Moss Brook
Old Eea Brook
Overflow Channel
Sale Water Park
Chorlton Water Park
Chorlton Brook
Fallowfield Brook
Black Brook
Mill Brook
Timperley Brook
Fairywell Brook
Baguley Brook
Norbury Brook
Poynton Brook
Booth Green Brook
Macclesfield Canal
Middlewood Way (Ryles Wood Brk)
Horse Coppice Reservoir
Bollinhurst Reservoir
Gorton Reservoir
Ashton Canal
Audershaw Reservoir
Warburton Farm Brook
Cheadle Hulme Brook / Lady Brook
Brinnington Brook
Turves Brook
Bramhall Brook
Pheff Brook
Gore Brook
Cheadle Water Park
Sale Water Park
Chorlton Water Park
Poynton Lake
69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99
SJ

3.11 RECREATION, AMENITY AND ANGLING

3.11.1 General

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

3.11.2 Local Perspective

There are numerous sites within the Mersey sub-catchment which provide recreational facilities. There are several sites which provide water based activities including water-skiing, sailing, windsurfing, canoeing, jet skiing, rowing, fishing, power boat racing and sub-aqua. A large number of these activities take place at Sale Water Park (owned by the NRA) and Chorlton Water Park. Canoe slaloms take place on the River Mersey at Trafford. Several Community Water Sports Centres are situated in the Mersey catchment, including Debdale Sailing Centre and Trafford Water Sports Centre, which is located at Sale Water Park.

Many other types of land based recreation are available in the area including many footpaths, cycleways, bridleways, permanent orienteering courses and golf courses. There is also a designated area for motorised sports at Carrington Tip. There is a wetland nature reserve, Broad Ees Dole, which is situated at Sale Water Park. The Micker Brook / Lady Brook Valley Park, run by Stockport Metropolitan Borough Council, is an area for informal recreation. Also within the catchment are areas of woodland, parkland and open fields, including Urmston Meadows, Stenner Woods. **(See Map 24)**.

A Joint Committee of local authorities funds the Mersey Valley Warden Service. The aim is to provide facilities for informal recreation activities. This includes laying down and signposting new footpaths and bridleways, providing fencing, stiles and benches, erecting picnic tables and constructing car parks. There is a lack of interpretation along public footpaths to present the natural and historical development of the River Mersey **(Issue SCW 3)**.

The Mersey Valley Visitor Centre was opened in 1984 and is situated at the eastern end of Sale Water Park. The Visitor Centre houses a seasonally changing display, a staffed information desk and a café. The Mersey Valley Warden Service provide a countryside contact for local schools, volunteers, the public, landowners and farmers; they encourage the use of the valley and increase public awareness.

Informal fishing is increasing on the River Mersey particularly around Northenden and downstream. Angling is popular at Sale Water Park and Chorlton Water Park. Chorlton Water Park is well stocked with coarse fish and has developed into a popular fishery. It has 80 fixed fishing platforms and good access for wheelchairs on the South side of the lake. Trout fishing takes place on Norbury Brook which is controlled by a local angling club. Angling takes place on Debdale Reservoir which is controlled by Levenshulme Angling Club.

3.11.3 Environmental Objectives

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

3.11.4 Environmental Requirements.

Water Quality :

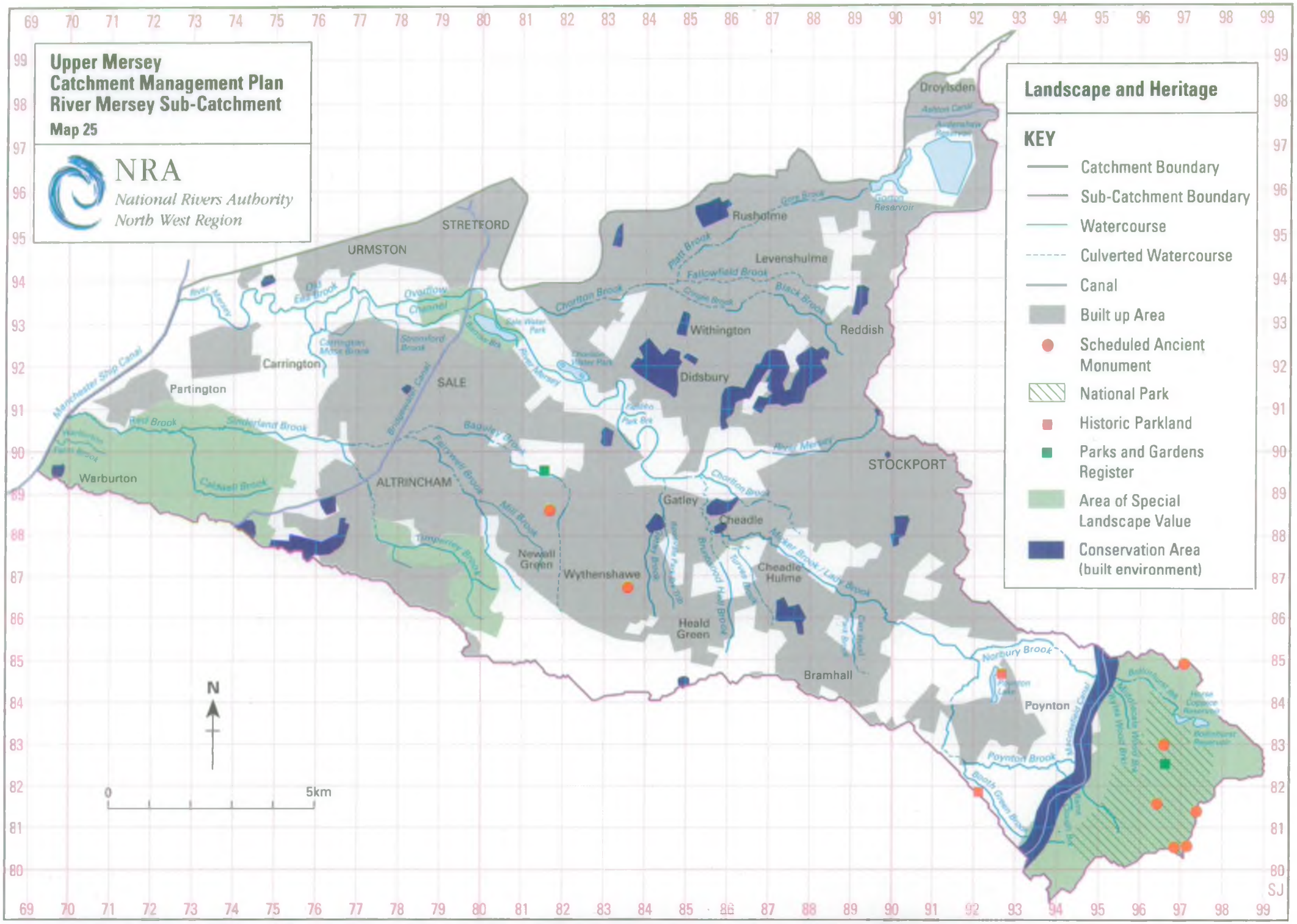
- The minimum requirements are the protection of the amenity value of the watercourse.
- The water should be free from surface films and unnatural floating material, litter and unpleasant odour.

Water Quantity :

- A flow pattern which provides suitable conditions for recreation and amenity and angling.
- A monthly flow pattern which does not fall below the established natural low flow conditions.

Physical Features :

- Sufficient access points for recreational and angling activities should be available.
- A mixture of open water, different flow rates and, instream and bankside vegetation should be available.
- Facilities are required where in river obstruction occur, for river users to be able to pass, for example, launch and retrieval points at weirs.
- Improvements, where required, in riverside recreational facilities, especially in urban areas.


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 25
NRA
National Rivers Authority
North West Region
Landscape and Heritage
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
Scheduled Ancient Monument
National Park
Historic Parkland
Parks and Gardens Register
Area of Special Landscape Value
Conservation Area (built environment)
Droylsden
Rusholme
Levenshulme
Reddish
Withington
Didsbury
STRETFORD
URMSTON
Carrington
Partington
SALE
Warburton
ALTRINCHAM
Newall Green
Wythenshawe
Gatley
Cheadle
Cheadle Hulme
Heald Green
Bramhall
STOCKPORT
Poynton
N
0
5km
SJ

3.12 LANDSCAPE AND HERITAGE

3.12.1 General

The NRA has a statutory duty to promote the conservation and enhancement of natural beauty. Inland and coastal waters, for land associated with such waters and to have regard to the desirability for protecting and conserving buildings, sites and objects of archaeological architectural or historic interest.

This duty covers nationally important areas and sites, for example, Areas of Outstanding Natural Beauty, National Parks and Scheduled Ancient Monuments, as well as locally valuable areas and sites.

Opportunities for enhancement of natural beauty are achieved through the activities of third parties (through negotiations with local authorities and developers) and as part of the NRA's activities.

3.12.2 Local Perspective (Map 25)

River corridors provide valuable open space within this highly urbanised catchment.

The landscape quality of these corridors is variable ranging from culverted and fenced-off urban sections, visually intrusive and uniform flood banks, to localised natural sections. The latter illustrate the visual variety in bank and channel features, which the system can create when unrestrained.

Designations at national level include the fringe of the Peak District National Park, nine Scheduled Ancient Monument sites and two registered parks and gardens.

Designations at local level include the 23 Built Conservation Areas and five Areas of Special Landscape Value (ASLV), including Sale Water Park.

Landscape detractors within the catchment are typical of an urban/urban fringe area. These include heavy industrial land use at Carrington, typical urban watercourse problems such as litter, vandalism, bank tipping by land owners, urban fringe land uses, sewage works, road noise and views, pylon routes, derelict land, and culverted sections of watercourse.

The open flat landscape character of the Mersey Valley is accentuated by the highly maintained public open space, flood banks and golf courses and the low density of river bank trees.

There are many initiatives linked to improving the environment within the Mersey sub-catchment, including plans for woodland planting by the Red Rose Community Forest.

The Mersey Valley is a potential link to the countryside for the large urban population and to other river valleys such as the Goyt and Tame. This potential is recognised by local planning policies, which generally protect river corridor open space.

There is a need for enhancement, and there are good opportunities with a well established open space network. Much of this is in public ownership, for example, along the River Mersey and Baguley Brook.

3.12.3 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:

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

3.12.4 Environmental Requirements

Water Quality:

- To be aesthetically acceptable, that is water to be free from surface films, unnatural floating material, litter discolouration and unpleasant odours.
- Should not deteriorate to a level such that sensitive heritage sites lose their interest.

Water Quantity:

- A flow pattern 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:

- In general to conserve and promote a diversity of natural features within the river valley and along the river corridor which are in keeping with the local landscape character.

3.13 DEVELOPMENT

The NRA has a pro-active role in the land-use planning system, advising Local Planning Authorities (LPAs) and developers, on matters concerning the water environment. The aim is to ensure future development is sustainable and land use change is guided and implemented in accordance with NRA policy.

Past development has had a major influence on shaping the catchment. New development must be carefully considered, to recognise both the potential adverse effects and the benefits, change can have on the water environment.

Major Developments

A new line on the Metrolink system is proposed to connect Manchester City Centre to Manchester International Airport. The proposal includes a new crossing of the River Mersey adjacent to the Jackson's Boat Public House, together with minor crossings of other watercourses.

Major Highways

The A6(M) Stockport North-South By-pass scheme is being designed by L.G.Mouchel & Partners and will affect Norbury Brook in this catchment.

The M66 Manchester Outer Ring Road scheme is also being designed by L.G.Mouchel & Partners and will affect Gore Brook in this catchment.

The M63 Widening Junctions 6 to 9 scheme is being designed by Parkman Consulting Engineers and will affect the River Mersey and the Mersey Overflow Channel.

A Planning Application has been submitted to undertake open cast mining at Tower Farm, Poynton. This may result in low flow in a section of Norbury Brook adjacent to the site and a local lowering of the water table **(Issue SS2)**.

3.13.1 Development Policy

Early in this century, the Manchester Corporation Act was passed which prohibited development in certain areas of the Mersey flood plain. Nowadays, there is pressure for development of the flood plain of the River Mersey. Also, many existing properties perceive themselves to be protected because they are behind flood banks. However, they are still within the flood plain and do not appreciate their vulnerability to flooding. This leads to extensions to properties and further development, both on the flood plain and behind flood banks, putting more property at risk **(Issue SCW1)**.

There has been severe erosion of the banks of the River Mersey from Ashton Weir to Irlam Weir, due to natural river meander migration. Over recent years, the adjacent landowners have attempted to protect their land by tipping down the banks without consent. In the worst cases, unregulated tips have been opened and tipping of waste

material on the flood plain has taken place. The tip operators are often attempting to raise their land above the flood level, or protect it from erosion, thus reducing the amount of land available for flood plain. Furthermore, the material is generally waste material and landfill gas is often generated. Although attempts have been made to regulate and prohibit this activity, the tip operators have proved to be elusive and in many cases, untraceable. This has resulted in considerable loss of flood plain and a consequent increase in flooding risk elsewhere.

The scheme which constructed the Timperley Brook FSR provides a standard of protection against flooding to property up to a 1 in 30 year level. Consequently, the run-off from any new development on or upstream of Timperley Brook should be restricted to the 1 in 30 year level from the undeveloped site.

Storage of run-off is requested for all developments which drain to the upper reaches of Bruntwood Hall Brook. This area, until recently, was largely undeveloped, whereas the lower reaches are urbanised with several culverts, which are prone to blockage and flooding.

3.14 HYDRO POWER (including Mill Rights)

There are no licences in the Mersey sub-catchment for abstraction for Water Power.

4 ISSUES AND OPTIONS

The catchment management planning process allows the differences between a vision of the catchment and an assessment of its current status, to be identified. These differences, or shortfalls in achieving this vision, become issues within the plan. Options are generated to address these issues and through the catchment management planning process an action plan will be drawn up to achieve the vision of the catchment within a planned timescale.

In this report, we have identified the current and potential future uses of the catchment and targets have been outlined which aim to ensure that these uses can be sustained. We have described the current status of the catchment and identified a number of issues. These issues require consideration by all those interested in the future of the catchment's natural waste environment. The options which are described in this report to address the issues, represent a range of alternative courses of action and are generally not mutually exclusive. The final action plan which will be drawn up following extensive consultation, may include a combination of the options shown or further options identified during the consultation period.

Each issue is presented in the following manner:

1 A short description of the issue.

2 An attempt to determine the options to address the issue.

3 Identification of those responsible for action.

4 An assessment of the advantages and disadvantages associated with a particular option.

4.1 SUB-CATCHMENT WIDE (SCW) ISSUES

SCW1 Increasing numbers of properties at risk from flooding, due to the development of the flood plain.

Early in this century, the Manchester Corporation Act was passed, which prohibited development in certain areas of the Mersey flood plain. Nowadays, there is pressure for development of the flood plain of the River Mersey. Also, many existing homes are thought to be protected, because they are behind flood banks. However, they are still within the flood plain and vulnerable to flooding. This leads to extensions to properties and further development, both on the flood plain and behind flood banks, putting more property at risk.

OPTIONS		Responsibility	Advantages	Disadvantages
1.	Continue to object to flood plain development, even if the development is protected by flood banks.	NRA, Local Planning Authority.	Further property is not put at risk from flooding.	Restricts land available for development.
2.	Ensure that policies related to flood plain protection are incorporated into relevant Local Plans and/or UDP are enforced.	NRA, Local Planning Authority.	No increase in property at risk from flooding. Protection of river corridor habitats and features. Retention of Mersey Valley as important landscape, conservation and amenity feature. Protection and retention of Mersey Valley SBI.	Possible conflict with economic development of land. Limited powers to ensure policy carried out especially if planning permission is granted.
3.	Continue development and produce warning schemes.	NRA, Local Authority.	Allows development of available land.	Flood risk remains. Warnings do not fully remove damage and stress caused by flooding cost to NRA and local authorities in producing warning service.

Cont/d....

Cont/d....

OPTIONS	Responsibility	Advantages	Disadvantages
4. Continue development and provide flood defence schemes.	NRA, Local Authority	Allows development of available land.	Schemes only possible if cost beneficial. Cost to NRA and Local Authorities through Flood defence levy. Limited funds for development of protection to existing properties.
5. Do nothing			More property put at risk from flooding

SCW 2 **Possible adverse impact of Metrolink line on water environment.**

Greater Manchester Passenger Transport Executive (GMPTE) have put forward proposals to extend the Metrolink in the Mersey sub-catchment. The proposed route will cross a number of watercourses, listed below. The greatest impact on the river environment will be on the Mersey Valley around Jacksons Boat/Hardy Lane area. The river crossing here will be extensive and will either take the form of a viaduct or a bridge with an embankment. Both will have a significant visual impact on the Mersey Valley landscape, with the embankment potentially acting as a barrier across the valley.

The NRA (together with other bodies) are involved in detailed discussions with the developers and their Consultants to try to ensure that the environmental impacts of all river and stream crossings will be minimised wherever possible.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Mersey Crossing using viaduct and other watercourse crossings.	GMPTE/Mott MacDonald.	Transport Link between Manchester City Centre and Manchester International Airport.	Potential visual and landscape impact on River Mersey, Chorlton Brook, Fairywell Brook and Baguley Brook, Mill Brook and Barrow Brook.
2. Crossing area on an embankment.	GMPTE/Mott MacDonald.	As above.	Impact on landscape, recreation and amenity.
3. No development.		No impact on river valleys.	No transport link.

GMPTE - Greater Manchester Passenger Transport Executive

SCW3 **Lack of interpretative material along public footpaths on the River Mersey.**

There is scope to provide a comprehensive system of signs and interpretation boards along public rights of way to point out features of interest, to link the network to other long distance paths, and to improve the surface of footpaths and provide seating. In addition, scope for creating a more visually diverse river corridor should be explored. This is an opportunity for a partnership project between the Mersey Valley local authorities and the National Rivers Authority.

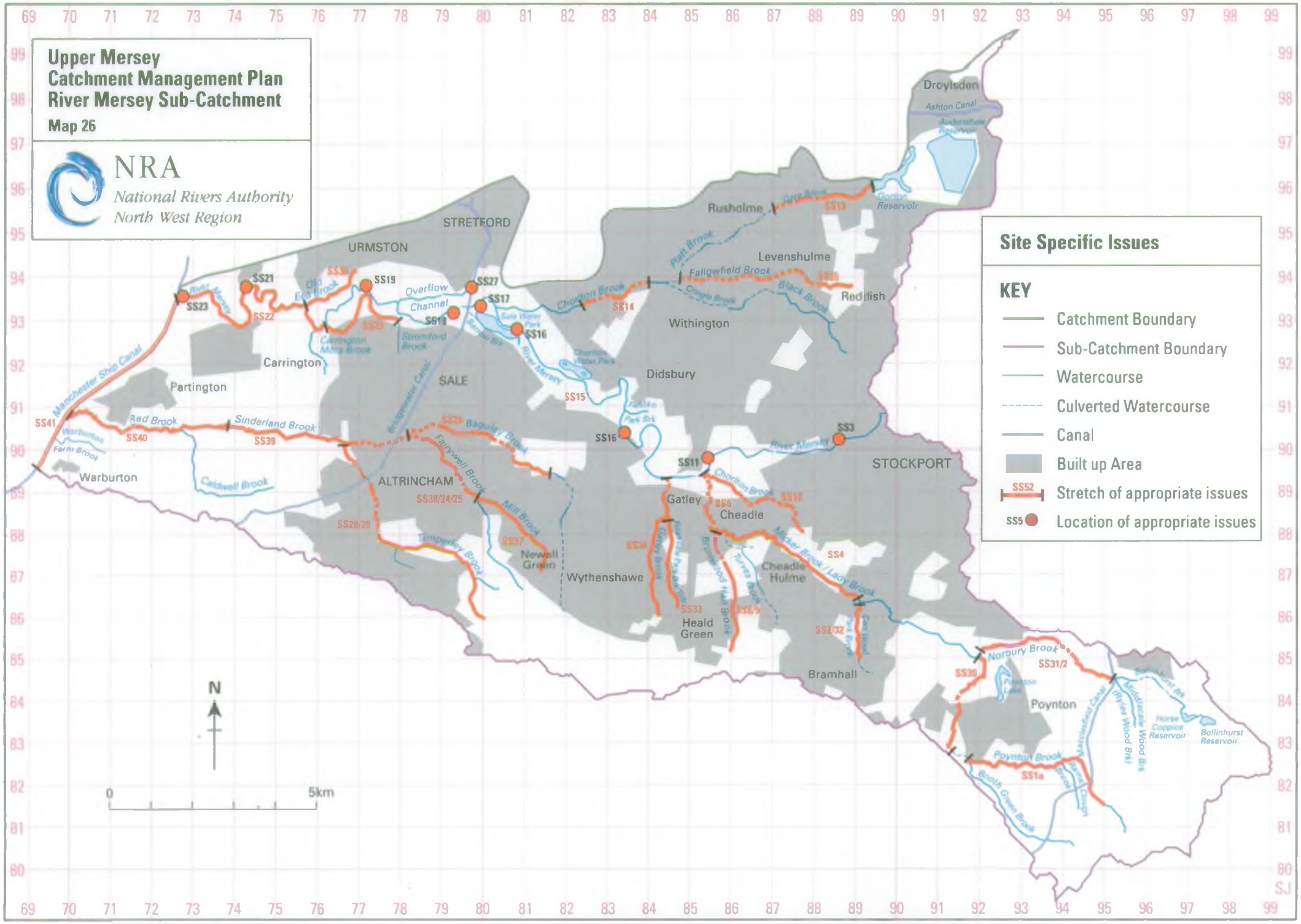
OPTIONS		Responsibility	Advantages	Disadvantages
1.	Identify suitable locations for interpretation boards and signs.	NRA, Local Authority.	Education and amenity benefits.	Cost and maintenance implication.
2.	Create leaflet to accompany Mersey Valley Walking Guide series.	NRA, Local Authority.	Education and amenity benefits.	Cost.
3.	Development partnership with local authorities and community groups.	NRA.	Education and amenity benefits.	Cost.

SCW4 **Difficulty in undertaking maintenance activities, improvement works, recreational and amenity due to lack of access.**

Maintenance of the watercourses in residential areas is often complicated by difficulty in access, due to garden fences, backing onto the banks, leaving little space for maintenance. These developments were prior to the watercourses being designated as Main River and therefore, at the time of construction, did not come under Byelaw control. This is a particular problem on Baguley Brook, Timperley Brook, Fairywell Brook and Micker Brook.

Furthermore access restrictions to watercourses also have a negative impact on landscape, conservation and amenity interests, with a lack of access for linear open space along rivers.

	OPTIONS	Responsibility	Advantages	Disadvantages
1.	Enforce flood defence byelaws and ensure working areas alongside main rivers are not prejudiced in future.	NRA	Maintains and improves access to river corridors.	Difficulty in "policing" all main rivers.
2.	Encourage Local Authorities to adopt a similar stance on ordinary watercourses.	NRA, Local Authorities.	As above.	Difficulty in "policing" ordinary watercourses. Local Authorities often unaware of legislative powers.
3.	Improve access to the channel through development control when the opportunity arises.	NRA, Local Authorities, Landowners.	Improves the access at no capital cost to the NRA.	NRA staff resources are required. Cost to developers.
4.	Purchase of specialised maintenance equipment.	NRA.	May enable work to be more efficient.	Cost. Does not improve access to river corridors.
5.	Selectively improve public access to watercourse and encourage extending linear parks whilst ensuring there is no reduction in conservation interest or recreational use.	NRA, Local Authorities, Landowners, Ramblers Associations, Warden Services.	Improve the public perception of the value of the water environment. Allow more people to enjoy rivers and their corridors.	Land take. Maintenance. Security of riverside properties.


Upper Mersey
Catchment Management Plan
River Mersey Sub-Catchment
Map 26
NRA
National Rivers Authority
North West Region
Site Specific Issues
KEY
Catchment Boundary
Sub-Catchment Boundary
Watercourse
Culverted Watercourse
Canal
Built up Area
SS52
Stretch of appropriate issues
SS5
Location of appropriate issues
Droylsden
Ashton Canal
Audenshaw Reservoir
Godley Reservoir
Rusholme
Levenshulme
Fallowfield Brook
Platt Brook
Chorlton Brook
Black Brook
Redbrook
Withington
STRETFORD
URMSTON
Carrington
Partington
SALE
Didsbury
Manchester Ship Canal
Red Brook
Sinderland Brook
Warburton
Warburton Farm Brook
Catchwell Brook
ALTRINCHAM
Bridgewater Canal
Baguley Brook
Fairywell Brook
Timperley Brook
Mill Brook
Newall Green
Wythenshawe
Gatley
Cheadle
Cheadle Hulme
Heald Green
Bramhall
STOCKPORT
River Mersey
Norbury Brook
Poynton
Poynton Brook
Bollinhurst Reservoir
Horse Coppice Reservoir
Wood Bay
Marcliffe Park
Fallowfield Park
Chorlton Water Park
Sale Water Park
Overflow Channel
Old Edge Brook
Carrington Moss Brook
Stromford Brook
Bulls Mersey
SS1
SS1a
SS2
SS3
SS4
SS5
SS11
SS13
SS14
SS15
SS16
SS17
SS18
SS19
SS21
SS22
SS23
SS24
SS25
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SS27
SS28/29
SS30
SS31/2
SS32
SS33
SS34
SS37
SS38/24/25
SS39
SS40
SS41
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5km
69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99
SJ

4.2 SITE SPECIFIC (SS) ISSUES (Map 26)

SS1(a) Poynton Park Brook - Poynton

Several culverts are prone to blockage and the resulting flooding affects residential properties.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Replace the culverts with larger capacity culverts.	Riparian Owner/NRA	Reduced risk of blockage. Improves the existing level of flood protection.	Works cost may be greater than the benefits. Traffic disruption.
2. Raise defences upstream.	NRA/Riparian Owner	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Blockage risk remains. Visual impact.
3. Install debris screens.	Riparian Owner, Local Authority	Reduced risk of blockage.	Works cost may be greater than the benefits. Does not improve the existing level of flood protection.
4. Consider designation as Main River.	NRA/MAFF	Allows the regular maintenance of the brook, if necessary. Allows the improved regulation of development within the river corridor.	Additional cost of maintenance. More NRA staff resources required to undertake regulation.

SS1(b) **River Mersey - Review of perceived flooding problems**

A review of these problems to prioritise schemes is required. The following sites will be included :

River Mersey at Waterside Hotel, Sinderland Brook at Woodhouses Sale, Broom Green Brook at Hope Green, Norbury Brook at Brookside Garden Centre.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Complete the review.	NRA	Cost beneficial schemes will be identified and included in the North West region long term plan.	Non-cost beneficial locations will continue to flood.

SS2 **Norbury Brook at Poynton**

A proposal to undertake open cost mining may result in low flows in a section of Norbury Brook.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Ensure that compensation water is added to the watercourse at the appropriate location.	Developer	No degradation of the aquatic environment.	Cost of the works.
2 Monitor the flow regime, if open cast mining proceeds.	NRA	No cost to the developer.	NRA staff resources required. New gauging station may be required. Degradation of the aquatic environment may not be prevented.

SS3 **River Mersey - Brinksway**

There is no bed control and therefore it is not suitable for accurate hydrometric measurement.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Install a bed control.	NRA	Improvement in the quality of hydrometric data.	Cost of the works.
2 Relocate gauging station.	NRA	Improvement in the quality of hydrometric data.	Cost of the works. Possible environmental impact at chosen location.

SS4 **Micker Brook**

There is a lack of hydrometric data for Micker Brook

OPTIONS	Responsibility	Advantages	Disadvantages
1. Ascertain level of customer demand.	NRA.	If sufficient demand a new gauging station should be built.	Cost of gauging station. Possible environmental impact at chosen location.

SS5 **Micker Brook - Bramhall/Cheadle**

Risk of flooding from inadequate channel capacity and bridges.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Replace bridges.	Highway Authority, NRA	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Traffic disruption.
2. Resection and/or regrade the channel	NRA, Riparian Owner	Improves the existing level of flood protection. Potential for habitat improvement.	Works cost may be greater than the benefits. Impact on Aquatic life.
3. Raise defences or construct flood walls.	Riparian Owner, NRA	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Visual impact. Loss of continuity of watercourse with its corridor habitats and features.

SS6 **Lumb Brook - Bramhall**

Intermittent pollution of watercourse, particularly oil, from the Conoco oil depot site.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Implement a Consent to control and monitor any discharges to the watercourse from the Conoco site.	NRA to negotiate with the Company conditions for a Consent to Discharge. Conoco to undertake site improvements to reduce the risk of contaminated surface water discharges.	Improvement in the aesthetic and amenity value.	Cost to Conoco

SS7- **Carrwood Park Brook - Robins Lane, Bramhall**

Risk of flooding due to several inadequate capacity culverts

OPTIONS	Responsibility	Advantages	Disadvantages
1 Replace culverts	Highway Authority, NRA	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Traffic disruption.
2. Raise defences or construct flood walls,	Riparian Owner, NRA	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Visual impact. Loss of continuity of watercourse with its habitats and features.

SS8 **Bruntwood Hall Brook - Cheadle**

An inadequate capacity culvert is prone to blockage problems

OPTIONS	Responsibility	Advantages	Disadvantages
1. Replace culvert with a larger capacity culvert.	Highway Authority, NRA	Improves the existing level of flood protection. Reduces risk of blockage.	Works cost may be greater than the benefits. Traffic disruption.
2. Raise flood defences upstream.	Riparian Owner, NRA	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Possible environmental implications.
3. Provide storage upstream.	NRA	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Right to flood required. Environmental implications.

SS9 Bruntwood Hall Brook - Cheadle

Dumping of garden cuttings on the banks in the area of Daylesford Avenue

OPTIONS	Responsibility	Advantages	Disadvantages
1. Continue current initiatives, which raise awareness of the problems caused by dumping.	NRA, Water Watch	Reduced the amount of dumping taking place.	Continued funding required.
2. Prosecute offenders.	NRA	Reduces the amount of dumping taking place.	Legal costs. It is difficult to identify individual offenders.

SS10 Chorlton Brook - Cheadle

Properties are at risk from flooding due to inadequate capacity culverts

OPTIONS	Responsibility	Advantages	Disadvantages
1. Replace culverts	Highway Authority, NRA	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Traffic disruption.
2. Create more open channel sections wherever possible.	NRA, Riparian Owner	Improves the existing level of flood protection. Access for maintenance will be made easier. Improve habitat diversity.	Works cost may be greater than the benefits. May attract more debris.

SS11 **RIVER MERSEY - Cheadle Bridge**

Protection of large sandmartin colony

OPTIONS	Responsibility	Advantages	Disadvantages
1. Minimalise bank stabilisation by applying development control policy.	NRA, GMEU, RSPB, riparian owner.	Retention of habitat for sandmartin colony.	Cost to riparian owner due to loss of land in future. May have future impact on the safety of the gas main within the bank.

GMEU - **Greater Manchester Ecology Unit**
RSPB - **Royal Society for the Protection of Birds**

SS12 **Gatley Brook - Gatley**

Road and properties at risk from flooding due to inadequate culverts and channel

OPTIONS	Responsibility	Advantages	Disadvantages
1. Replace with larger capacity.	Highway Authority, NRA	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Traffic disruption.
2. Resection and/or regrade the channel.	NRA, Riparian Owner	Improves the existing level of flood protection. Potential for habitat improvement.	Works cost may be greater than the benefits. Impact on aquatic life.
3. Raise defences or construct flood walls.	NRA, Riparian Owner	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Visual impact. Loss of continuity of watercourse with its corridor habitats and features.

SS13 **Gore Brook - Audenshaw**

Aesthetic deterioration due to intermittent pollution from storm sewer overflow discharges. This has restricted the fauna which is dominated by pollution tolerant species.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Reduction in organic and debris load from an unsatisfactory sewer overflow.	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.	Improvement to aesthetic and amenity value. Improvement of the aquatic ecosystem and invertebrate diversity.	Cost to NWW Ltd and possibly customers.

SS14 **Chorlton Brook - Fallowfield**

Flooding problems affecting residential properties

OPTIONS	Responsibility	Advantages	Disadvantages
1. Construct flood defence scheme.	NRA	Improves the existing level of flood protection. Maintenance operations easier.	Cost of the works.
2. Do nothing.	NRA	No initial cost outlay.	Continued risk of flooding. High maintenance costs.

SS15 **River Mersey - Banks Rehabilitation**

Risk of uncontrolled flooding to flood plain due to degeneration of existing flood banks from Brinksway to Ashton Weir

OPTIONS	Responsibility	Advantages	Disadvantages
1. Repair flood banks.	NRA	Ensures current level of protection. Flood basins utilised as intended.	Difficult in justifying cost of works.
2. Identify opportunities for moving flood banks back where it does not conflict with existing land use.	NRA	Connects flood plain with river corridor.	Works costs may be greater than benefits.
3. Raise flood banks.	NRA	Improves level of flood protection.	Works cost may be greater than benefits

SS16 **River Mersey - Northenden Weirs and Sale Ees**

Deterioration of the weirs leads to erosion of the banks

OPTIONS	Responsibility	Advantages	Disadvantages
1. Repair the weirs, ensuring the ability for the passage of fish and canoeists.	NRA	Protects the river banks from erosion. Improve passage of fish and recreational use.	Works cost may be greater than the benefits.

SS17 **River Mersey - Sale Ees**

Lack of information on operation of side weir and overflow channel. The mechanism by which the side weir operates and the capacity of the channel are unknown

OPTIONS	Responsibility	Advantages	Disadvantages
1. Include the side weir and overflow channel in the hydraulic computer model for the River Mersey.	NRA, Local Authority	Improves the understanding of the river system.	Additional cost of survey and modelling.

SS18 **River Mersey - Ashton-on-Mersey**

Large stand of Giant Hogweed

OPTIONS	Responsibility	Advantages	Disadvantages
1. Systematic treatment programme for control and eradication of Giant Hogweed.	Riparian Owners	Increase habitat diversity for wildlife. Reduce the health danger to public and livestock.	Cost of treatment. Scale of problem. Will not prevent further spread of the plant by natural mechanisms.
2. Promote public awareness for public safety and to prevent spread.	NRA, Mersey Valley Wardens.	Increase public safety.	Resource implications.

SS19 **River Mersey - Ashton Weir**

The weir crest at this important gauging station is in a poor state of repair

OPTIONS	Responsibility	Advantages	Disadvantages
1. Repair weir crest.	NRA	Improvement in the quality of hydrometric data.	Lack of NRA resources.
2. Reconstruction of the weir with inclusion of fish pass.	NRA	Improvement of hydrometric data. Free passage for fish.	Larger scale of scheme. Lack of NRA resources.
3. Reconstruction of weir with inclusion of a canoe pass.	NRA	Improve recreation.	Lack of resources. May affect hydrometric data.

SS20 **Stromford Brook - Sale STW to River Mersey**

The brook is poor in terms of water quality and visual appearance. The cause of this can be attributed to the discharge from Sale STW, which has a high dry weather flow that discharges to a brook with a comparatively low natural flow. Some work is to be undertaken by NWW Ltd on Sale STW and also on the Manor Avenue pumping station, from where regular discharges have an impact on the brook.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Reduction in discharges from sewage pumping station.	NRA, NWW Ltd, to agree improvements required to achieve satisfactory performance. NWW Ltd, to undertake capital works.	Improvements in aesthetic and amenity value. Improvement of the aquatic ecosystem and invertebrate diversity.	Cost to NWW Ltd, and possibly customers.

SS21 **River Mersey - Flixton**

An inadequate capacity road bridge causes flooding to a road and agricultural land

OPTIONS	Responsibility	Advantages	Disadvantages
1. Replace road bridge with a larger structure.	Highway Authority, NRA	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Traffic disruption.
2. Raise the flood banks upstream.	NRA	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Increased land take. River cut-off from flood plain habitats and features. Negative impact on Mersey valley SBI.

SBI - **Site of Biological Importance**

SS22 **River Mersey - Ashton-on-Mersey to Carrington**

Impact on Mersey SBI by tipping/bank stabilisation

OPTIONS	Responsibility	Advantages	Disadvantages
1. Restrict bank stabilisation by applying development control policy.	NRA	Protect natural river corridor and SBI. Reduce risk of flooding by rubbish and waterborne debris.	Much of the work is undertaken without Consent.
2. Continued action by enforcement officer due to problems caused by tipping.	NRA, WRA	Improve visual appearance of the river. Stops the decrease in flood plain area.	Many of the offenders are untraceable.
3. Prosecute offenders.	NRA, WRA		Many of the offenders are untraceable.

WRA - **Waste Regulation Authority**
SBI - **Site of Biological Importance**

SS23 **River Mersey - Irlam Weir**

The large weir can often trap trees, removal of which can be hazardous.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Rebuild the weir with better access provision.	NRA	Maintenance is possible.	Works cost may be greater than the benefits.
2. Include fish pass in the reconstruction.	NRA	Free passage of fish.	Additional costs.

SS24 **Fairywell Brook**

Aquatic invertebrate community failure to reach diversity consistent with river habitat

OPTIONS	Responsibility	Advantages	Disadvantages
1. Investigate possible sources of pollution and pursue remedial measures as appropriate.	NRA, Local Councils	Improvement in aquatic ecosystem and invertebrate diversity. Achievement of biological water quality objectives.	Cost Scale of problem. Resource implication.

SS25 **Fairywell Brook - Altrincham**

Risk of flooding from inadequate channel capacity.

OPTIONS		Responsibility	Advantages	Disadvantages
1.	Replace culverts and increase channel capacity.	Riparian Owner, NRA	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Traffic disruption.
2	Raise defences or construct flood walls.	Riparian Owner, NRA	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Visual impact. Loss of continuity of watercourse with its corridor habitats and features. Potential Ecological impact and the river may be restricted.
3.	Create more open channel sections wherever possible.	NRA	Potential of habitat diversity. Improves existing flood defence. Access for maintenance will be made easier.	Works cost may be greater than benefits and may attract more debris.

SS26 **Baguley Brook - Altrincham**

Risk of flooding from inadequate channel capacity.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Resection and/or regrade the channel.	NRA, Riparian Owner	Improves the existing level of flood protection. Potential for habitat improvement.	Works cost may be greater than the benefits. Impact on aquatic life
2. Raise defences or construct flood walls.	Riparian Owner, NRA	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Visual impact.

SS27 **River Mersey at Broad Ees Dole**
Timperley Brook Flood Storage Reservoirs

Presence of alien pest species Crassula

OPTIONS	Responsibility	Advantages	Disadvantages
1. Systematic treatment programme for control and eradication from site.	Trafford Metropolitan Borough Council/NRA	Protect the diversity of aquatic flora.	Cost.
2. Promote public awareness.	NRA	Minimise spread of pest species.	Crassula may be difficult to eradicate.

NB: Crassula is an Australian Biting Stonecrop, often sold in Garden Centres/Aquatic Centres as an oxygenating plant.

SS28 **Timperley Brook - Altrincham**

Properties at risk from flooding due to inadequate culvert and channel capacity.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Replace culverts with larger capacity.	Highway Authority, NRA	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Traffic disruption.
2. Resection and/or regrade the channel.	NRA. Riparian Owner	Improves the existing level of flood protection. Potential for habitat improvement.	Works cost may be greater than the benefits. Impact on aquatic life.
3. Raise defences or construct flood walls.	Riparian Owner, NRA	Improves the existing level of flood protection.	Works cost may be greater than the benefits. Visual impact. Loss of continuity of watercourse with its corridor habitats and features.

LONG TERM WATER QUALITY ISSUES.

Issues which will require resolution in order to achieve the Long Term River Ecosystem River Quality Objective.

Despite the clear issues, which once resolved should allow for the achievement of the short-term River Quality Objective, there are reaches which currently comply with their proposed short-term River Quality Objective, although water quality issues may still be evident. Such problems give rise to Long Term River Quality Objectives. These objectives are what the NRA would desire, and although there is no current expenditure planned, or committed for dealing with such issues, it is hoped that they can be resolved in the future, hence achieving the Long Term River Quality Objective.

SS29 Timperley Brook

Aesthetic deterioration of Brook and failure to achieve proposed long term biological water quality objective

Localised pollution occurs as a result of contaminated surface water discharges from wrongly connected drains, particularly in the area of Altrincham football ground. The aquatic invertebrate community is severely impaired and only pollution tolerant fauna is present.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Elimination of pollution from wrong connections to surface water drains.	NRA to pursue investigation/enforcement work. NWW Ltd, Trafford Metropolitan Borough council to undertake investigation/ enforcement work. NWW Ltd, householders to undertake remedial works.	Improvement to aesthetic and amenity value and fishery potential. Increased invertebrate diversity and improvement of aquatic ecosystem.	Cost to NWW Ltd, and possibly to customers and householders.

SS30 **Poynton Brook - Poynton Bridge to Micker Brook**

Failure to achieve chemical and biological water quality objectives

The reach fails to achieve its long term objective due to urban run-off and intermittent storm water discharges. Organic inputs to Poynton Brook have resulted in an invertebrate fauna dominated by pollution tolerant species.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Assess the impact from and if required seek a reduction in the discharges from combined sewer overflows.	NRA, NWW Ltd to agree improvements required for satisfactory performance. NWW Ltd to undertake capital works.	Improvement to aesthetic and amenity value and fishery potential. Improvement to the aquatic ecosystem and invertebrate diversity.	Cost to NWW Ltd and possible customers.

SS31 **Norbury Brook - Norbury Hollow to Poynton Brook**

Failure to achieve proposed long term River Ecosystem RQO, and biological water quality objectives

The reach fails to achieve its long term objective due to urban run-off and intermittent storm sewer discharges. The fauna is dominated by species which are able to tolerate mild organic pollution.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Assess the impact from and if required seek a reduction in the discharges from sewer overflows.	NRA. NWW Ltd, to agree improvements required for satisfactory performance. NWW Ltd to undertake capital works.	Improvement to aesthetic and amenity value and fishery potential. Improvement in aquatic Ecosystem and invertebrate diversity.	Cost to NWW Ltd and possibly customers.
2. Investigate possible pollution sources. If appropriate instigate remedial work.	NRA to monitor and investigate. Responsible parties to undertake remedial measures.	Possible achievement of water quality objective.	Cost to responsible parties.

SS32 Carr Wood Park Brook - Bramhall

Carr Brook is a small unclassified tributary of Micker Brook. It has a poor aesthetic appearance as a result of intermittent pollution from unsatisfactory sewer overflows.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Reduction in the debris and organic load from unsatisfactory sewer overflows.	As a requirement by the EC Urban Waste Water Treatment Directive. NRA, NWW Ltd to agree improvements required to achieve satisfactory performance. NWW Ltd to undertake capital works.	Improvement in the aesthetic and amenity value. Improvement to the Aquatic Ecosystem and invertebrate diversity.	Cost to NWW Ltd and possibly customers.

SS33 **Rose Vale Park Tributary of Gatley Brook**

The main tributary of Gatley Brook from Rosevale Park flows through 2 parks and a golf course. The tributary is grossly polluted and stretches of the bed covered in a sewage fungus, the pollution is caused by wrong connections to the surface water drainage system.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Investigate and eliminate pollution from wrong connections to surface water drains.	NRA to pursue to agree investigation, enforcement. NWW Ltd Manchester City Council to undertake investigation, enforcement work. NWW Ltd, householders to undertake remedial work.	Improvement to aesthetic and amenity value and fishery potential. Improvement of aquatic ecosystem and invertebrate diversity.	Cost to NWW Ltd and possibly customers. Direct cost to householders.

SS34 **Gatley Brook - Gatley**

Failure to achieve proposed long term River Ecosystem and biological water quality objectives

The reaches failure to achieve the long term water quality objective is the result of urban run-off and possible organic and debris load discharged via sewer overflows. The main tributary of Gatley Brook from Rosevale Park also impacts on the water quality.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Investigate possible pollution sources. If appropriate instigate remedial work.	NRA to monitor and investigate. Responsible parties to undertake remedial measures.	Possible achievement of water quality objective.	Cost to responsible parties.
2. Assess the impact and if required seek a reduction in the input from sewer overflows.	NRA, NWW Ltd to agree improvements required for satisfactory performance. NWW Ltd to undertake capital works.	Improvement to aesthetic and amenity value and fishery potential. Improvement to the aquatic ecosystem and invertebrate diversity.	Cost to NWW Ltd and possibly customers.

SS35 **Fallowfield Brook - Chorlton Brook to Reddish**

Aesthetic deterioration of brook and failure to achieve proposed biological water quality objective

Most of the length of this water course is culverted, however, where the brook is open it has a poor aesthetic appearance. Visible indications of pollution include sewage fungus and litter. Intermittent contaminated discharges, from wrongly connected surface water drains in the Reddish area, have an impact on Fallowfield Brook. Organic pollution has resulted in colonisation by pollution tolerant species.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Investigate and eliminate pollution from wrong connections to surface water drains.	NRA continue to pursue investigation/enforcement work on areas outstanding. NWW Ltd, Manchester CC to undertake investigation/enforcement work. NWW Ltd, householders to undertake remedial works.	Improvement to the aesthetic and amenity value of the watercourse. Improvement to the aquatic ecosystem and invertebrate diversity.	Cost to NWW Ltd, householders.

SS36 **Old Eea Brook - Urmston**

Failure to achieve proposed long term River Ecosystem and biological water quality objectives

The failure to achieve the proposed objective for the reach has been attributed to a contaminated storm water drain at Meadow gate. There may also be intermittent discharges from sewer overflow. The aquatic invertebrate community is also severely impaired, only species tolerant of organic pollution are present

OPTIONS	Responsibility	Advantages	Disadvantages
1. Investigate the elimination of the organic load from a wrongly connected surface water drain at Meadowgate.	NWW Ltd, Trafford Borough Council to investigate. NWW Ltd, responsible parties to undertake remedial measures.	Possible achievement of water quality objective. Improvement of the aquatic ecosystem and invertebrate diversity.	Cost to NWW, responsible parties.

SS37 **Mill Brook - Roundthorn**

Periodic aesthetic deterioration of the Brook

Mill Brook runs some of its length in culvert through the Roundthorn Industrial Estate. The water course is contaminated as a result of drainage problems on the site. There are also problems from littering in the open stretch of the brook. Mill Brook has an impact on Fairywell Brook of which it is a tributary.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Investigate possible elimination of periodic pollution from Industrial Estate.	NRA to pursue investigation of estate drainage. Responsible parties to carry out investigatory works. Industrial site owners to undertake capital works.	Improvement in aesthetic and amenity value.	Cost to responsible parties. Cost to Industrial site owners.

SS38 **Fairywell Brook - Whitecarr Lane to Baguley Brook**

Failure to achieve proposed biological water quality objective

In 1994 this stretch was affected by an incident of toxic pollution from an upstream and unknown source. The resultant fauna was severely impaired with only a single shrimp present. In Fairywell Brook generally the aquatic community fails to reach diversity consistent with the river habitat.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Investigation of pollution problems affecting the Brook.	NRA	Improvements to the aquatic ecosystem and invertebrate diversity.	Resource implications.

SS39 **Sinderland Brook - Fairywell Brook to Altrincham STW**

Failure to achieve proposed long term River Ecosystem and biological water quality objectives

The failure of the reach to achieve the long term water quality objective is primarily due to urban run-off. An incident in 1994 of toxic pollution entering the brook severely impaired the fauna.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Investigate possible pollution sources. If appropriate instigate remedial work.	NRA to monitor and investigate. Responsible parties to undertake remedial measures.	Possible achievement of water quality objective. Improvement to aquatic Ecosystem and invertebrate diversity.	Cost to responsible parties.

SS40 **Sinderland Brook - Altrincham STW to Manchester Ship Canal**

Failure to achieve proposed long term Rver Ecosystem and biological water quality objectives

The reach fails to meet its long term water quality objective and has a severely impaired aquatic invertebrate community. This reach receives discharges from two NWW Ltd sewage treatment works. An assessment of Altrincham STW is to be undertaken to look at dilution in the brook, and the visual impact of the STW discharge downstream. The water quality of the upstream reach also has a direct impact on the water quality.

OPTIONS	Responsibility	Advantages	Disadvantages
1. Investigate possible pollution sources. If appropriate instigate remedial work.	NRA to monitor and investigate. Responsible parties to undertake remedial measures.	Possible achievement of water quality objective.	Cost to responsible parties.
2. Evaluate the organic load from Altrincham STW, and seek reduction if appropriate.	NRA to undertake an evaluation and promote within other regulatory influences capital expenditure by NWW Ltd as appropriate. NWW Ltd to undertake capital works.	Improvement to aquatic ecosystem and invertebrate community. Improvement of amenity value and fishery potential.	Cost to NWW Ltd and possibly customers.

APPENDICES

GLOSSARY

ABSTRACTION LICENCE

A licence to abstract water issued by the NRA. The maximum annual, daily, and hourly abstraction rates are normally set within the terms of the licence.

AQUIFER

A layer of underground porous rock which contains water and allows water to flow through it.

BED

The bottom of a river.

BED CONTROL

Stable river bed which limits the movement of bed materials.

BERM

A shelf at the base of a bank at normal flows which gives extra channel width in high flows.

CARR

Wet woodland composed of trees such as willow and alder, which is a successional stage between open water and dry woodland.

CHANNEL

A cutting in land along which a river flows.

CONFLUENCE

Point where two, or more, rivers meet.

CLOUGH

A small steep sided river valley.

COMPENSATION WATER

Water released from a reservoir to maintain the flow required in the river.

CULVERT

A man-made structure, for example a pipe, carrying a watercourse underground.

CYPRINIDS

The carp family of fish comprising some 200 freshwater species.

DEPOSITION

Where a river flows more slowly it may deposit gravel, sand and silt in its channel - often on the inside edge of bends or meanders.

DIFFERENT UNITS FOR FLOW MEASUREMENT

m^3/s	Cubic metres per second (cumec)
l/s	Litres per second
Mld	Megalitres per day
mgd	Millions of gallons per day

Conversion Table

m^3/s	Mld	mgd
0.012	1	0.224
0.06	5	1.12
0.12	10	2.24
0.24	20	4.48
0.6	50	11.2
1.2	100	22.4

DRIFT

Superficial deposits covering solid rock. Often deposited by rivers or by former glaciation in the form of boulder clay, peat or sands and gravels.

DRY WEATHER FLOW

It is a selected flow that is not exceeded for ten successive days which is also referred to as a Q95 flow.

FAUNA

Animal life.

FLUVIAL

Adjective of rivers.

FRESHWATER FISH

For the purpose of the Salmon and Freshwater Fisheries Act 1975, fish other than salmon, brown trout, sea trout, rainbow trout and char.

GEOMORPHOLOGICAL FEATURES

Physical features of a river, which include meandering (winding) channel, gravel beds and shoals, ox-bows, earth cliffs and river terraces.

HYDRAULIC CONTINUITY

The relationship between groundwater and surface water flow.

INVERTEBRATE

Animal without a backbone for example insects.

LEACHATE

Liquid containing material in solution, draining from the ground.

LOAD

A measure of the material carried by a river either in suspension or as dissolved material.

MAIN RIVER

Some, but not all, watercourses are designated as Main River. Main River status of a watercourse must first be approved by MAFF. The NRA has the power to carry out works to improve drainage or protect land and property against flooding on watercourses desginated as Main River.

MAJOR AQUIFER

Water bearing rocks which are capable of yielding significant volumes of groundwater due to its high permeability and porosity.

MARGINAL

At the water's edge

MINOR AQUIFER

Water bearing rock of limited extent, capable of supporting medium/small abstractions.

NON AQUIFER

Rock of low permeability containing little or no groundwater (may support very limited abstractions).

OCHRE

Iron based orange discolouration.

PASTURE

Semi-improved and improved grazed grassland.

POOL

A deep slowing flowing section of a river or stream.

PRECIPITATION

The total amount of water which falls as rain, hail, or snow expressed as mm or inches of rainfall over a specified period.

RETURN PERIOD

The frequency within which, on average, an event of a certain severity may be expected to return (expressed in years).

RIFFLE

A shallow, but fast flowing part of a river or stream.

RIPARIAN

Of, or on, the banks of a river.

RIPARIAN OWNER

Owner of land abutting a river or lake. Normally riparian owners own the bed of river to the mid point of the channel.

RIVER CORRIDOR

Stretch of river including its banks and the land close by.

SALMONIDS

Fish classified as belonging to the Salmon family, such as Salmon, Trout and Char.

SHOAL

A sand and/or gravel deposit at the edge of or within river channel.

STRATA

Layer of rock.

SPATE

Very high flows, usually associated with rain storms and often cause flooding. Spate flows naturally cleanse the river channel.

TERRACE

A raised flat area cut out of a hillside by the action of the river.

TOPOGRAPHY

Physical features of a geographical area.

TRANSFER STATION (Waste Disposal)

A licensed depot where controlled waste is stored and sorted for disposal or recycling.

WATER TABLE

The surface of a body of groundwater within the underground strata. The water table will fluctuate as a result of natural or artificial causes.

APPENDIX 2

ABBREVIATIONS

AOD	-	Above ordnance datum
CSO	-	Combined Sewer Overflow
DOE	-	Department of the Environment
EC	-	European Community
ESA	-	Environmentally Sensitive Area
EQS	-	Environmental Quality Standard
GMPTE	-	Greater Manchester Passenger Transport Executive
HMIP	-	Her Majesty's Inspectorate of Pollution
IPC	-	Integrated Pollution Control
LPA	-	Local Planning Authority
MAFF	-	Ministry of Agriculture Fisheries and Food
MBC	-	Metropolitan Borough Council
MCC	-	Manchester City Council
NNR	-	National Nature Reserve
NWC	-	National Water Council
NWW Ltd	-	North West Water Limited
QSL	-	Quality Survey Limit
RE	-	River Ecosystem
RQO	-	River Quality Objective

SBI	-	Site of Biological Importance
SPA	-	Special Protection Areas
SSSI	-	Site of Special Scientific Interest
STW	-	Sewage Treatment Works (also referred to as Waste Water Treatment Works)
SWQO	-	Statutory Water Quality Objectives
UDP	-	Unitary Development Plan
WML	-	Waste Management Licence
WRA	-	Water Resources Act

RIVER ECOSYSTEM CLASSIFICATION

The Surface Waters (River Ecosystem) (Classification) Regulations 1994, SI 1994 No. 1057, prescribe a system for classifying the quality of rivers and canals, to provide the basis for setting statutory water quality objectives (WQOs) under Section 83 of the Water Resources Act 1991 in respect of individual stretches of water.

The River Ecosystem Classification comprises five hierarchial classes, in order to decreasing quality: RE1, RE2, RE3, RE4 and RE5. The criteria which samples of water are required to satisfy are set out, for ease of reference, in the Table below.

Class	Dissolved Oxygen % saturation 10 percentile	BOD (ATU) mg/l 90 percentile	Total Ammonia mg N/l 90 percentile	Un-ionised Ammonia mg N/l 95 percentile	pH Lower limit as 5 percentile; upper limit as 95 percentile	Hardness mg/l Ca Co_3	Dissolved Copper ug/l 95 percentile	Total Zinc ug/l 95 percentile
RE1	80	2.5	0.25	0.021	6.0 - 9.0	≤ 10 >10 and ≤ 50 > 50 and ≤ 100 >100	5 22 40 112	30 200 300 500
RE2	70	4.0	0.6	0.021	6.0 - 9.0	≤ 10 >10 and ≤ 50 > 50 and ≤ 100 >100	5 22 40 112	30 200 300 500
RE3	60	6.0	1.3	0.021	6.0 - 9.0	≤ 10 >10 and ≤ 50 > 50 and ≤ 100 >100	5 22 40 112	300 700 1000 2000
RE4	50	8.0	2.5	-	6.0 - 9.0	≤ 10 >10 and ≤ 50 > 50 and ≤ 100 >100	5 22 40 112	300 700 1000 2000
RE5	20	15.0	9.0	-	-	-	-	-

APPENDIX 4

PROPOSED RIVER ECOSYSTEM (RE) RIVER QUALITY OBJECTIVES (RQOs) AND LONG TERM OBJECTIVES FOR BIOLOGICAL WATER QUALITY

Watercourse	Reach	Proposed Short-Term RE RQO	Proposed Long-Term RE RQO	Proposed Long-Term Objective for Biological Water Quality
Mersey	River Goyt/Tame confluence to Stockport STW	RE3 (1995)	RE3	B3
Mersey	Stockport STW to Princess Parkway	RE4 (1995)	RE4	B3
Mersey	Princess Parkway to Carrington Pumping Station	RE4 (1995)	RE4	B3
Manchester Ship Canal	Carrington Pumping Station to Woolston New Cut	-	RE4	-
River Mersey Tributaries				
Norbury Brk	QSL at Norbury Hollow to Poynton Brook	RE3 (1995)	RE2	B2
Micker Brk	Poynton Brook to confluence with River Mersey	RE2 (1995)	RE2	B2
Poynton Brk	QSL at Poynton Bridge to Micker Brook	RE3 (1995)	RE2	B2
Gatley Brk	QSL at Heald Green Station to River Mersey	RE5 (1995)	RE2	B2
Chorlton Brk	QSL at Tan Yard Brow to Cringle Brook	RE2 (1995)	RE2	B3
Chorlton Brk	Cringle Brook to confluence with River Mersey	RE3 (1995)	RE3	B3
Fallowfield Brook	QSL at North Reddish to confluence with Chorlton Brook	RE3 (1995)	RE3	B3
Cringle Brk	QSL at Heaton Chapel to Chorlton Brook	RE3 (1995)	RE3	B3
Old Eea Brk	QSL at SJ 7692 to River Mersey	-	RE4	B3
Sinderland Brook	QSL at Portway to Fairywell Brook confluence	RE4 (1995)	RE4	B3
Sinderland Brook	Fairywell Brook confluence to Altrincham STW	-	RE4	B3
Sinderland Brook	Altrincham STW to confluence with Manchester Ship Canal	RE5 (1995)	RE4	B3
Fairywell Brook	QSL at Whitecarr Lane to Sinderland Brook	RE4 (1995)	RE4	B3
Timperley Brook	QSL at Wellfield Lane to Sinderland Brook	RE5 (1995)	RE4	B3

Canal	Reach	Proposed Short-Term RE RQO	Proposed Long-Term RE RQO	Proposed Long-Term Objective for Biological Water Quality
Ashton	Junction with Peak Forest Canal to Robertsons site	RE2 (1995)	RE2	-

NRA

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