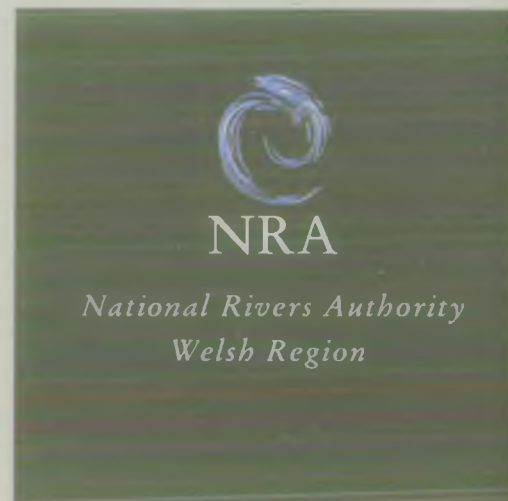


RHYMNEY CATCHMENT MANAGEMENT PLAN CONSULTATION REPORT



RHYMNEY CATCHMENT MANAGEMENT PLAN

CONSULTATION REPORT

JANUARY 1996

National Rivers Authority
Welsh Region

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ENVIRONMENT AGENCY



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THE AREA MANAGER'S VISION FOR THE RHYMNEY CATCHMENT

The River Rhymney is a typical South Wales valley river which is gradually recovering from its heritage of coal mining and heavy industry. The water quality is improving, the wildlife is returning to the catchment and the fisheries are being restored. Land reclamation schemes are gradually re-shaping the landscape into a greener and more attractive environment. The road schemes planned are working towards an increasing economic prosperity. People already put the river and its valley to numerous uses including angling, walking, bird watching and cycling and these developments will hopefully encourage wider use of the valley.

My vision is to further this environmental renovation of the Rhymney by managing the uses of the catchment in a sustainable way. Our key objectives are:

- * to continue to improve water quality by effective regulation of industry and investment in sewerage infrastructure.
- * to reduce the amount of litter and sewage-derived debris along the river banks.
- * to warn of impending floods and maintain and construct flood defences in order to protect people and property.
- * to manage the water resources so as to protect existing abstractions and to prevent environmental impact.
- * to ensure that any development proposals have no detrimental effect on the water environment. Early discussions with developers and contractors are essential.
- * to reinstate significant and self sustaining runs of salmon and sea trout.
- * to sustain and, where possible, improve stocks of brown trout and coarse fish.
- * to maintain and improve the conservation value of the catchment and protect the heritage resource.
- * to ensure that all those who wish to use the catchment for recreational purposes can enjoy doing so with mutual respect and consideration.

These objectives are based on the requirements for sustainable management of the water environment. They will therefore complement other plans which may address the needs of sustainable development within the Rhymney catchment. The views of local people and their representatives will be respected. We will need the help of the local communities and hope to build upon existing relationships and develop new ones in pursuing these goals. Through close liaison, regular reporting on our progress and our determination to fulfil our role, we intend to maintain the impetus for action in the Rhymney catchment.

Alun Gee

Dr Alun Gee (South East Wales Area Manager)

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PART I
THE RHYMNEY CATCHMENT
MANAGEMENT PLAN



**1.0 THE PURPOSE OF
CATCHMENT MANAGEMENT
PLANS**

1.0 THE PURPOSE OF CATCHMENT MANAGEMENT PLANS (CMPs)

1.1 THE ROLE OF THE NRA

The rivers, lakes, estuaries and coastal waters of Wales are subject to large and rapidly increasing demands from the users of water. Many different uses interact, or compete for water or water space, and may come into conflict with one another. The National Rivers Authority (NRA) aims to protect and improve the water environment in England and Wales and to harmonise conflicts between competing water users. Our general duties include: -

- Maintenance and improvement of water quality by control of pollution in surface and groundwater.
- Flood defence for people and property.
- Flood warning.
- The management of water resources to achieve the right balance between the needs of the environment and those of abstractors.
- Maintenance and improvement of fisheries.
- Conservation of the natural water environment.
- Promotion of water based recreation.
- Navigation (in some rivers).

We also play a key role in the strategic management of the interaction between users of the water and land environments.

We believe that it is important that the interests of all water users are considered in the development and protection of the water environment. Therefore, we have consequently chosen to promote our *vision* and management proposals via published Catchment Management Plans (CMPs).

1.2 WHAT THIS PLAN IS DESIGNED TO DO

This consultation document presents a number of issues and options for the future management of the Rhymney catchment and is based on a detailed study that we carried out during 1995. A number of proposals are presented for comment and it is intended that, following consultation with you and other river users, an Action Plan will be presented which will seek to manage conflicts in river use and optimise the overall benefits to all river users within the catchment.

The Action Plan will steer us in developing our own management programme for the catchment and guiding us in the way we respond to any development proposals.

This consultation document is divided into 2 parts:

- Part I:** Presents the range of management issues, and options to address them, that have been identified by the NRA;
- Part II:** Provides background information on the approach we took in developing this plan, using information on identified river Uses (including those to be incorporated in the new Water Quality Objectives scheme) and the statutory and informal targets required to support them. The targets are expressed in terms of water quality, water quantity and physical features.

We hope that you find the information in this consultation document informative and thought provoking (for your convenience, a glossary of terms and abbreviations has been included as an Appendix). Let us know whether you agree or disagree with our current proposals: remember this is not just our document, it is also yours: without your help we cannot produce a workable Action Plan that will be of benefit to you and all users of the Rhymney Catchment.

Please send any comments you may have on the Consultation Report to:

The Area Catchment Planner
National Rivers Authority
Welsh Region
Abacus House
St.Mellons Business Park
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The Environment Agency.

The new Environment Agency for England and Wales will be created in April 1996 by the merger of the NRA, Her Majesty's Inspectorate of Pollution and the Waste Regulation Authorities. It will be the largest environmental protection agency in Europe. While it will incorporate the full role of the NRA there will be wider responsibilities for integrated pollution prevention and control, of air, land and water. One of the Agency's principal aims will be to contribute towards attaining the governmental objective of achieving sustainable development by protecting or enhancing the whole environment.

The government has recognised both the success of integrated river basin management, as developed and practised by the NRA, and the importance of CMPs as an integral part of that philosophy. It is therefore anticipated that CMPs will continue as the focus for river basin management in the Agency, although they may be developed in the context of wider management plans for the protection and enhancement of water, land and air.

**FOLD OUT TO SEE MAP 1: THE RHYMNEY CATCHMENT
(TO BE READ IN CONJUNCTION WITH ALL OTHER MAPS)**

**2.0 AN OVERVIEW OF THE
RHYMNEYCATCHMENT**



2.0 AN OVERVIEW OF THE RHYMNEY CATCHMENT

2.1 Introduction

The Rhymney Valley has been intensively developed for its underlying wealth of coal. The catchment is small (233 km²) and high (rising to 617m at Cefn yr Ystrad) and the river short (58km) and steep. From the village of Machen (downstream of Caerphilly) the river briefly assumes a more lowland character before flowing out to the Bristol Channel at Cardiff.

2.2 Infrastructure

The main communication links, such as railways and main roads, all occupy the narrow valley floors and the main sewer lines run down many of the river channels. The towns of Rhymney, New Tredegar, Bargoed, Ystrad Mynach and Caerphilly all lie on the banks of the Rhymney or its tributaries. The Rhymney is also one of the three rivers of Wales' capital city, Cardiff. It flows through the eastern part of the city but not into Cardiff Bay.

2.3 Land Use

This catchment was dominated by the heavy industries of coal, iron and steel. The decline of these industries in the late 20th Century has led to an overall improvement in the environment of the whole catchment; the water quality has improved and the ecology is becoming richer. Caerphilly and Cardiff are the main industrial bases remaining, but many sizeable industrial estates are dispersed throughout the catchment. Hill farming and forestry are practiced throughout the catchment.

2.4 Flood Defence

This wet, mountainous catchment is susceptible to very rapid rises in river levels during heavy rainstorms. The flood peaks cascade quickly down to the coastal lowlands, downstream of Machen. Here, their progress slows and they often spread over the wide floodplain.

Those major centres of population which have had flooding problems in the past now have flood defences. These are designed to protect the properties against floods of up to 100 years return period, ie they could expect to be flooded only once in 100 years on average.

The areas liable to flooding are fairly small and are areas where costs of protection measures exceed the value of the benefits of the works.

The most recent severe events of flooding were in December 1992, December 1979 and December 1960. The highest tide levels this century occurred in February 1990, reaching a level of 7.95 metres above ordnance datum (AOD). Consequently, we currently recommend that even in areas sheltered from the open sea, future residential and commercial developments should be protected to 8.6 metres AOD. This allows for the predicted effects of global warming.

2.5 Hydrology

Owing to its mountainous nature and proximity to the sea, the catchment receives an average annual rainfall of 1383mm. Little of this falls as snow, despite the catchment's altitude. Although this rainfall is substantial, it is lower than the neighbouring Taff catchment which has a higher altitude and is more exposed. Consequently, the water resource available for exploitation is more modest. The average daily flow of the River Rhymney as it flows into its estuary is 530 million litres per day.

Although rain falls throughout the year, the thin sandy soils, the sandstones and the rocks of the coal measures do not retain large quantities of water in storage. Thus, river flows diminish quite rapidly during dry spells despite periodic flooding in the winter months. The typical dry summer's flow of the River Rhymney as it flows into its estuary is 70 million litres per day.

2.6 Hydrogeology

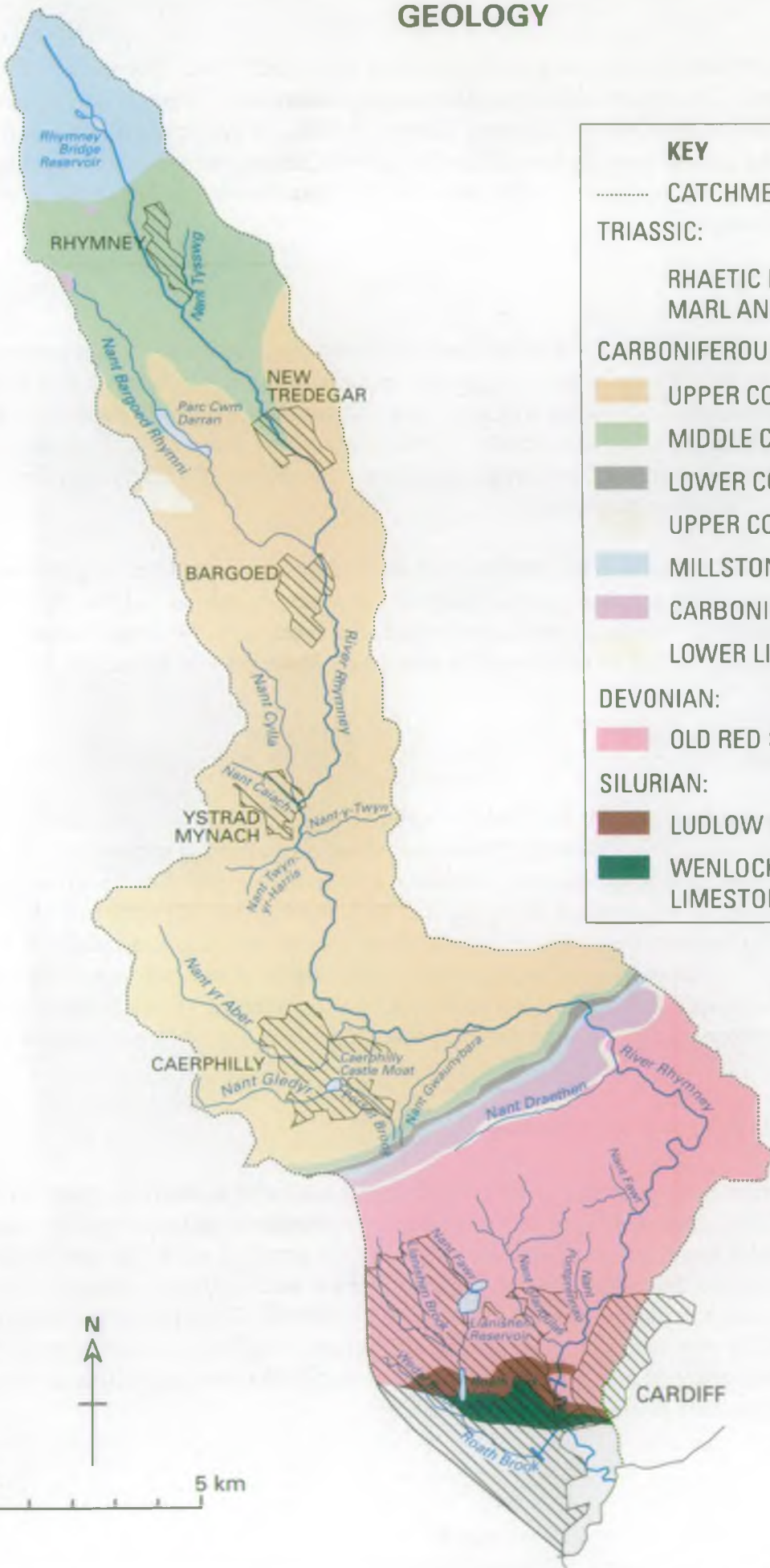
The coal measures' rocks, with their modest water storages, are the only locally important natural groundwater source. However, water also issues from the old mineworkings which are no longer pumped to permit coal extraction and have become filled with water. A complex network of subterranean flows has evolved amongst the old adits and shafts. In many places the iron enriched waters emerge from the ground, causing iron staining and poor water quality. The carboniferous limestone stores more water but only outcrops at Caerphilly Mountain and at the very top of the catchment around Rhymney Bridge. In these areas, the limestone gives rise to many local springs which can dry up in hot weather during the summer.

2.7 Fisheries, Conservation & Recreation

The improvement in water quality over the last 20 years has led to a steady increase in all fish stocks in the Rhymney, though occasional pollution incidents do cause temporary setbacks to the recovery. Coarse fish are present in the lower river, grayling are in the middle reaches and trout are found throughout the catchment. Salmon and sea trout, indicative of high quality water and habitat, are steadily increasing in numbers. They provide fishing in the lower and middle river as they migrate to spawning grounds higher up the catchment. There is scope for the continued improvement and development of the river and stillwater fisheries in an area where there is a high demand for fishing.

GEOLOGY

MAP 3.



KEY

..... CATCHMENT BOUNDARY

TRIASSIC:

RHAETIC BEDS KEUPER MARL AND CONGLOMERATE

CARBONIFEROUS:

UPPER COAL MEASURES

MIDDLE COAL MEASURES

LOWER COAL MEASURES

UPPER COAL SERIES

MILLSTONE GRIT

CARBONIFEROUS LIMESTONE

LOWER LIMESTONE SHALE

DEVONIAN:

OLD RED SANDSTONE

SILURIAN:

LUDLOW SERIES

WENLOCK SERIES WITH LIMESTONE

Being a narrow valley, most residents live close to the river which inevitably leads to a high recreational demand. Walkers, naturalists, anglers and cyclists all use the river environment and there is the potential demand for increased access by canoeists. High profile recreational sites such as Roath Park, Caerphilly Castle and Parc Cwm Darran are focussed around lakes and their associated streams.

The catchment's history of industrial and urban development has resulted in extensive riverbank protection works and a loss of wetland habitats. Despite this, many of the rivers remain tree-lined and the improved water quality has allowed the return of otters to the catchment. Typical riverine birds, such as dippers, kingfishers, grey wagtails and herons can now be observed. Further improvements in the nature conservation interest are possible with the collaboration and agreement of landowners, developers and Local Authorities. As a result of exploitation of the river in the past, there are a number of sites of historic interest associated with watercourses in the catchment.

2.8 Water Quality

The chemical quality of the river water of the whole Rhymney catchment is generally good but there are substantial lengths of river where the macroinvertebrate fauna is affected by intermittent pollution. The source of this, in most places, is sewage from combined sewer overflows (CSOs) and leaking sewer pipes. Many of the CSOs are unscreened so discharges also result in the introduction of a significant amount of non-biodegradable litter which collects on the river banks, causing a considerable visual impact. Sporadic inputs of contaminated run-off or spillages from industrial areas also occur and minewater discharges from abandoned mines are evident.

Despite these problems, the main river and most of the tributaries are of sufficiently high quality to support a salmonid fishery.

2.9 Monitoring

River Levels, Flows and Rainfall

The NRA operates a gauging station at Llanedeyrn in Cardiff to measure river flows in the Rhymney. This is used to regulate abstraction, and for warning of likely flooding. There are also river level gauges at Machen and Bargoed used solely for flood warning. Flows in a number of watercourses and minewaters are also measured by one-off spot gauging. Rainfall is measured daily at Rhymney Bridge reservoir and sent to the Meteorological Office at Bracknell.

Water Quality

Routine water quality samples are taken monthly at 27 sites throughout the catchment. Additionally, 15 discharges to the river are routinely sampled and analysed to ensure they meet the standards set for them by the NRA. We also carry out inspections of trade premises, industrial sites and sewage works as part of our pollution prevention programme.

We monitor five stretches within the catchment (on the Rhymney, Nant yr Aber and Bargoed Rhymni) for the EC Freshwater Fisheries Directive (78/659/EEC) and report the results to the Department of the Environment. The River Rhymney is also sampled at Llanrumney to monitor UK Red List Substances and those selected pollutants identified by the Paris Commission.

Biological Monitoring

We undertook routine biological monitoring at 23 of the water quality sampling points during 1994 as part of a rolling programme. Each site was sampled twice during the year, in spring and summer. An assessment of biological quality was made by determining the presence of species of insects and other small aquatic life which are sensitive to changes in water quality. Other biological surveys were carried out to discover the impact of pollution incidents, minewaters and other industrial discharges to the river.

Habitat Surveys

A River Corridor Survey of the main River Rhymney and the Bargoed Rhymni was undertaken in 1994. This involved the mapping of the habitats associated with the river corridor along the entire lengths of the rivers.

Fish Stocks

Rod catches of adult salmon and sea trout are reported by anglers, though it is thought that only a small proportion of fish caught are reported at present. The distribution and abundance of juvenile salmon and trout is assessed by electrofishing in tributaries and the upper river. The last survey was undertaken in 1991 and is being repeated in 1995. Records of angling club catches can be used to measure the performance and status of the coarse fisheries. Elver catches are monitored through catch returns.

2.10 KEY DETAILS

Catchment Area: 233 km² Highest Point: 617m (Cefn yr Ystrad)

Length of Main River Rhymney: 58km
 Length of all rivers and tribs in Rhymney Catchment: 275km

Populations: (solely in the Rhymney Catchment)

County Councils	Borough/ City Councils	1991*	2001 (Predicted)	2011 (Predicted)	2021 (Predicted)
Gwent	Islwyn	7387	7672	7544	7507
	Newport	396	390	394	392
Mid Glam	Rhymney Valley	95848	98161	100526	102059
South Glam	Cardiff	102059	114099	119852	125900
Total		205690	220322	228316	235858

*Based on the OPCS 1991 Census.

Flood Defence

Length of river maintained by NRA flood defence department: 80.7 km
 Length of Flood Defences: 20 km

Water Quality

% of Classified River Length in GQA Class (based on 3 years data 1992-1994)

Class A (Good)	58
Class B (Good)	42
Class C, D, E and F (Fair, Fair, Poor and Bad)	0

Length of River designated under EC Freshwater Fisheries Directive: 28.3km

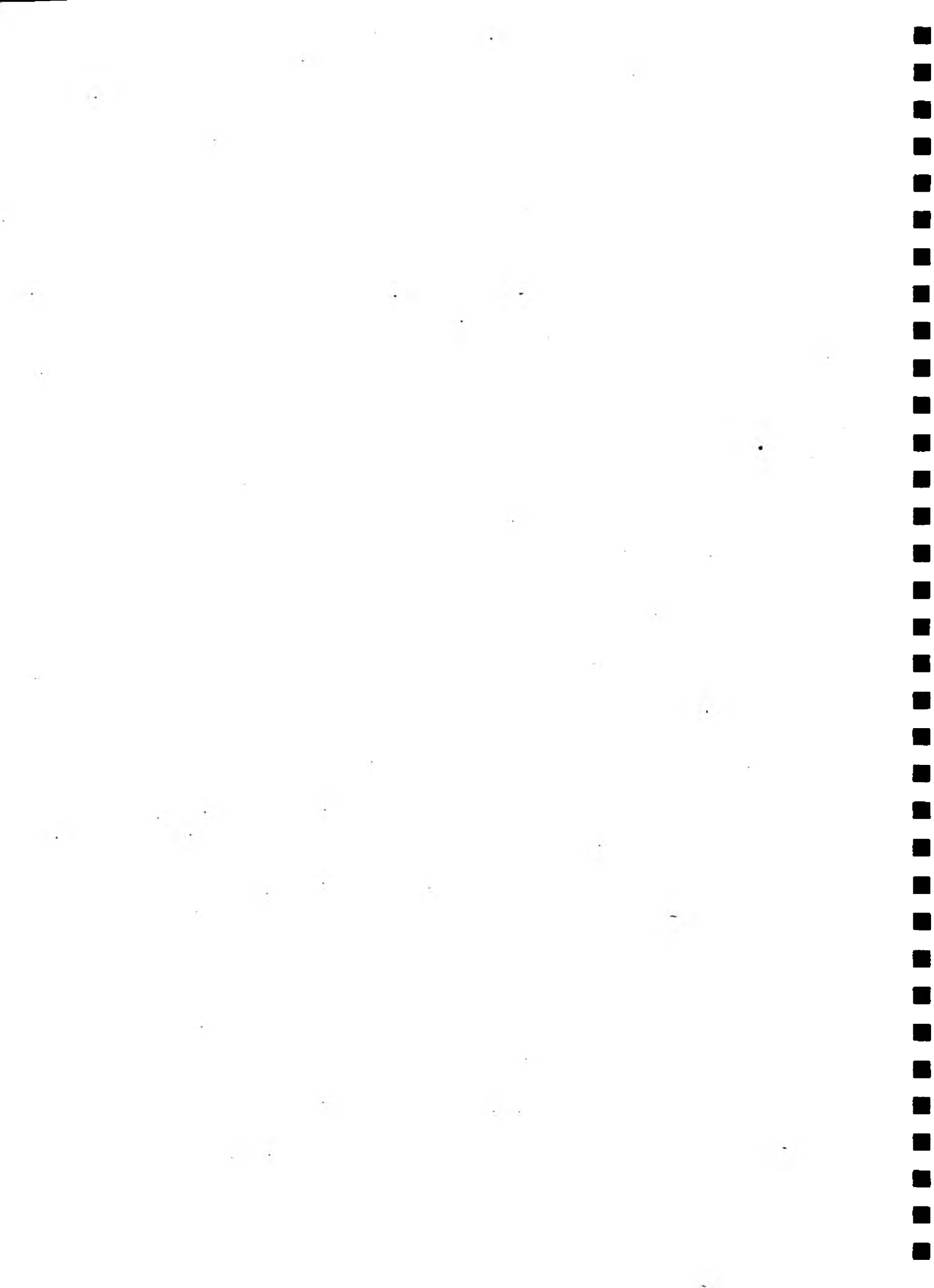
Water Resources

Average Daily Flow from River Rhymney: 530 megalitres per day
 Gross licensed abstraction: 67 megalitres per day
 Estimated volume of water abstracted and not returned: up to 6 megalitres per day

(1 megalitre is 1 million litres or 1000 cubic metres)

Fisheries

Average annual declared salmon rod catch 1990-1994: 1
 Average annual declared sea trout rod catches 1990-1994: 14
 Average annual salmon run size (estimate) 1990-1994: 20
 Average annual sea trout run size (estimate) 1990-1994: 100
 Regular coarse fishing bag weight: 15 lb
 No. salmon/sea trout anglers (approx.): 50
 No. trout anglers (approx.): 1500
 No. coarse anglers (approx.): 1000



3.0 ISSUES AND OPTIONS

This section of the Plan presents the key Issues that we have identified from our analysis of the Rhymney catchment. One or more suggestions are made for addressing each issue and you are invited to comment on these. This section relates solely to those areas which have been shown not to be able to support certain of the identified Uses; the rest of the catchment should be regarded as being able to support **all** identified Uses.

- Section 3.1 identifies in detail, those areas that fail to meet specific targets to support identified Uses. Significant areas of conflict between Uses are also discussed.
- Section 3.2 presents these **Issues** along with **Options**, identified by the NRA, to address them.
- The background information that has been used to identify these Issues is provided in **Part II** of this report, which lists the known Uses of the catchment and sets targets to support them.
- You should note that the Issues and Options do not constitute NRA policy but have been considered within our policy framework and that no priority should be inferred from the order in which they appear.



3.1 THE STATE OF THE CATCHMENT

- This section reviews the current quality of the catchment against the Targets set in **Section 5 in Part II**.
- The **Targets** are designed to protect the needs of the identified catchment Uses.
- The targets are also guided by the concepts of **sustainable development and environmental capacity**.
- This allows the key management **Issues** to be identified: potential solutions are discussed in **Section 3.2**.

3.1.1 WATER QUALITY

General

In addition to compliance with water quality targets, we use information from biological monitoring surveys to assess the state of the catchment. Information on the invertebrate fauna found in rivers is particularly useful since the animals present reflect the water quality of the river in the preceding weeks or months, unlike chemical data which presents a series of 'snapshots' of water quality. A further benefit is that invertebrates respond to a far wider range of polluting materials than are routinely tested for by chemical monitoring. We can therefore use biological data as supporting evidence for issues generated by assessment of chemical quality and to identify new issues which are not detected by chemical sampling alone. Biological monitoring is particularly useful in small streams which are not routinely sampled chemically. In Welsh Region we use biological techniques for the rapid assessment of watercourses affected by acidification (acid rain) and farm pollution. Additionally we employ biological assessments of point sources such as sewage treatment works, industrial sites and mine discharges to identify the need for improvements.

Local Perspective

Water quality in all stretches meets the River Ecosystem Class Targets set for them (see Map 23). However biological and visual indicators and day-to-day pollutions have shown that there are still some problems with water quality. This has occurred from intermittent pollution and/or the effect of chemicals that are not routinely measured for assessing compliance with River Ecosystem standards. These problems are illustrated on Map 4 and described fully in the following issues. The nominated stretches of river under the Freshwater Fish Directive (Map 24) were all compliant with the exception of the River Rhymney downstream of Bargoed Rhymni where one sample collected marginally exceeded the limit for unionised ammonia.

ISSUE 1

THE IMPACT OF COMBINED SEWER OVERFLOWS (CSOs) AND INADEQUATE SEWERAGE NETWORK ON THE WATER ENVIRONMENT

As stated before, there are no River Ecosystem Class failures, but there are stretches where the biological assessment indicates poorer water quality than the chemical assessment. This might suggest intermittent polluting discharges. The discrepancies are confined to the main river and are considered to be due to intermittent sewage discharges from CSOs. Such discharges cause significant pollution affecting the biological quality of the river. The fauna can become dominated by invertebrate species tolerant of organic pollution. Discharges from CSOs are also responsible for sewage derived litter and can cause growths of sewage fungus on the bed of the river.

ISSUE 2

UNKNOWN SOURCES OF IMPACTS ON THE WATER QUALITY OF THE NANT BARGOED RHYMNI, NANT YR ABER AND PORSET BROOK

The biological assessment of the lower Nant Bargoed Rhyzni, Nant yr Aber and Porset Brook indicates a poorer water quality than the chemical assessment might suggest. This means that either intermittent pollution or chemicals which are not routinely monitored are affecting the water quality. The reasons for the poor biological quality are currently unknown and will require further investigation.

ISSUE 3

THE IMPACT OF MINEWATER FROM ABANDONED COAL MINES

With the closure of the coal mines in the catchment, cessation of pumping of minewater has resulted in recovery of the groundwater level. As a consequence, there are overflows from abandoned workings at 6 sites (Map 4) in the Rhydney catchment. The most significant of these is the one at Tir y Berth. All these discharges contain iron salts and cause staining of the river bed with bright orange iron hydroxide. In some cases there is also a biological deterioration with an associated impact on the natural food of fish and smothering of spawning gravels. Over 4 km of river are affected.

In 1994 we assessed the extent and impact of minewater discharges throughout the Welsh Region. Further investigations were then carried out to examine the possibility of pumping, intercepting or treating of the most significant of these minewater discharges in order to reduce their impact on the watercourses. This "Phase 2" investigation included the discharge to the River Rhydney at Tir y Berth.

A review of the usage of minewater for industry or water supply purposes has also been undertaken by the NRA and Dŵr Cymru Welsh Water (DCWW). The results of this review indicated that:

- they were small quantity discharges
- their quality was variable and therefore difficult to treat
- there were no major water users close enough to use the discharges

We will continue to survey the catchment for new discharges and will seek to take advantage of all opportunities to implement remedial schemes. The NRA has also undertaken Research and Development (R&D) Projects on this subject (see Appendix 4). In addition, we are seeking the support of Mineral Planning Authorities through the use of planning conditions to address land use issues associated with unsatisfactory discharges from abandoned mines.

For mines abandoned after 31 December 1999, the Environment Act 1995 removes statutory protection from prosecution. This will ultimately enable the forthcoming Environment Agency to deal with pollution from these mines. Nevertheless, discharges from existing mines abandoned before this date may continue to cause problems.

ISSUE 4

EFFECTS OF LITTER, FLY TIPPING AND ABANDONED VEHICLES

These problems are common to most of the South Wales valley rivers and the River Rhymney is no exception.

1. Litter

Sewage derived litter will be reduced following the uprating of unsatisfactory combined sewer overflows as part of DCWW's second Asset Management Plan (known as AMP2) programme. Over the last three years we have been involved with Keep Wales Tidy, the Local Authorities and other organisations tackling this problem, principally on the River Taff. Local Voluntary Groups have been successfully established in the Taff catchment which have adopted designated stretches and undertaken litter removal. It is hoped to extend this initiative to the Rhymney catchment and build on the success already achieved, supported by publicity and educational campaigns.

2. Fly Tipping

It is illegal to deposit litter in watercourses and the NRA policy is to prosecute fly tippers wherever possible. Local Authorities also have the power to prosecute those who fly tip on the banks of watercourses under the Environmental Protection Act 1991. Items of furniture and shopping trolleys are regularly deposited in various watercourses throughout the catchment and if these pose a significant flood risk we have to remove them as soon as possible, placing a further burden on NRA resources.

3. Abandoned Cars

Stolen cars are periodically abandoned in the river channels throughout the catchment and this problem is particularly prevalent in the Llanrumney area. The abandoning of cars is a potential flood risk which has financial implications since they have to be removed with the minimum of delay.

ISSUE 5

THE IMPACT OF ILLEGAL CONNECTIONS FROM DOMESTIC PROPERTIES ON THE WATER ENVIRONMENT

The discharge of wastewaters from domestic appliances such as washing machines and dishwashers is referred to as sullage. These appliances should be connected to the foul sewerage system but householders continue to disregard or are ignorant of the advice given by manufacturers, Local Authorities and ourselves. The problem is widespread and a feature of many new housing developments where drainage is provided by separate systems for foul and surface water.

We shall continue to liaise with the Local Authorities to resolve those problems identified. The Local Authorities have powers under the Building Act 1984 to remedy illegal connections within domestic properties. The effectiveness of publicity campaigns targeted at new developments will also be assessed. This problem is not restricted to the Rhymney Valley but appears throughout Britain. As such, work will also be undertaken at a National level.

ISSUE 6

DIFFUSE OR INTERMITTENT POLLUTION FROM INDUSTRY AFFECTING THE WATER ENVIRONMENT

The NRA wishes to control oil and chemical storage at industrial sites by the implementation of regulations similar to those which apply to farming.

The Rhymney catchment contains many factories and industrial estates. All such sites have the potential to cause pollution from contaminated surface water run-off and spillages of chemicals direct to a watercourse. We also inspect industrial sites and advise on pollution prevention measures. As statutory consultees, we advise planning authorities and developers during the planning stages of new developments on the pollution prevention measures required.

Intermittent industrial pollution affects aquatic life causing discrepancies between biological quality and chemical quality in stretches of the River Rhymney at Caerphilly and the Nant Cylla below Penallta Industrial Estate.

The Wedal Brook/Roath Brook which flows through some widely used recreational areas (Heath Park, Roath Park and Waterloo Gardens) in Cardiff also suffers from many intermittent industrial discharges.

ISSUE 7

THE IMPACT OF PENRHOS TIP LEACHATE ON THE WATER ENVIRONMENT

The biological quality of the Nant Gledyr above Caerphilly Castle is poor. This is caused by the discharge of leachate to the Nant Gledyr from Penrhos Tip which received industrial waste deposits during the 1970s. Agreement was reached prior to the formation of the NRA by our predecessors the Welsh Water Authority that this leachate would in part be accommodated in the foul sewer which would be laid to serve the site development. The developer has engineered a system to intercept outbreaks of leachate along the tip periphery, convey it to a collection point and discharge it to the foul sewer up to the maximum volume permitted by the terms of the trade effluent consent issued by DCWW.

3.1.2 WATER QUANTITY

General

A catchment would fail its targets for water resources if abstraction was causing rivers and streams to dry up or flows to become unacceptably low.

Licences of Right had to be granted in 1965 without regard to the ability of the resource to sustain the abstraction in the long term without detriment. Over the years, the actual rates of abstraction have, in some cases, increased to the volumes specified in the licences. As this occurs, the potential arises for low flows or declining groundwater levels.

We have considered carefully the available surface and groundwater resources within the Rhymney catchment and their degree of utilisation. The following Section summarises the results of this analysis. It must be stressed that where no problems or areas for further investigation have been identified, we are satisfied that resources are adequate. As more information becomes available, for example about the actual flow requirements of the aquatic ecosystem, we will review our management of resources in each catchment.

Assessment of the catchment assumes that existing licence conditions are complied with. The NRA has a policy of active inspection and enforcement of licence conditions.

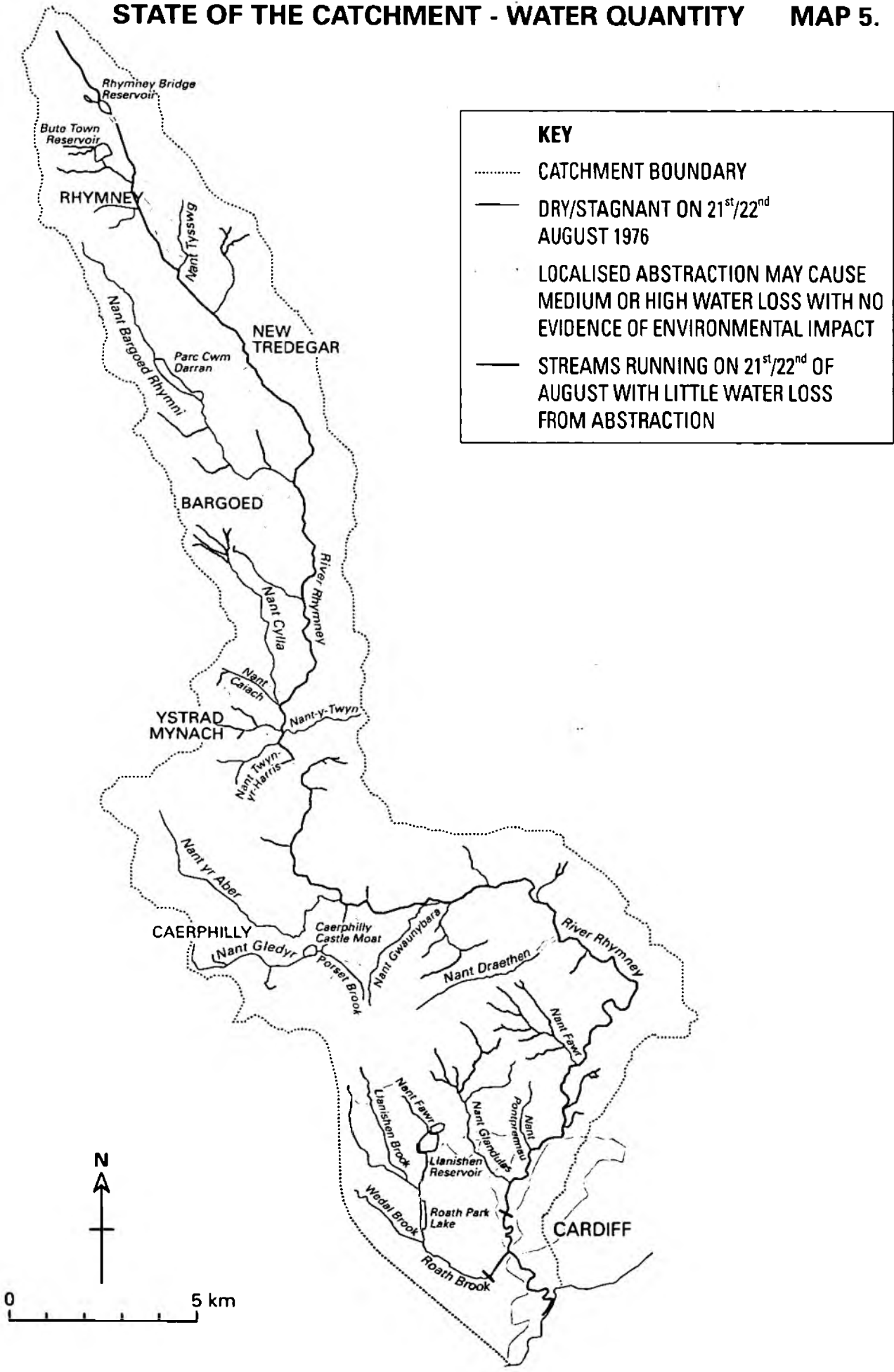
No allowance has been made for climatic change because future scenarios are uncertain and within the lifespan of this Plan (5 years) any change is unlikely to be significant.

Local Perspective

The Rhymney and its tributaries can seem lacking in adequate flow in dry summer conditions. This, in keeping with many other rivers draining the South Wales coalfield, is largely a natural phenomenon. The river channels are generally wide for the volume of flows which they carry so the water tends to be spread thinly over the river bed. The river flows also naturally decline quite rapidly in dry periods because relatively little water is stored in the soils and rocks. In very dry summers, some smaller watercourses will be reduced to a series of pools or dry up completely. This is illustrated by Map 5 which shows the extent of this at the height of the 1976 drought. Although the minewater discharges can cause quality problems, they do benefit the quantity of river flow as they maintain a fairly consistent discharge during the summer months. Without these the flows would be even lower.

It is not possible to make a definitive assessment of how much water the riverine ecology needs, but during the lifetime of this plan we will be able to implement the Welsh Regional Licensing Policy. This will provide an

STATE OF THE CATCHMENT - WATER QUANTITY MAP 5.



objective and rigorous estimate of the effect of abstraction upon the catchment.

As the Regional Licensing Policy is still being tested, we have assessed the state of the catchment by comparing the water lost from abstraction with the typical natural flow in the rivers during a dry summer (the Q95). This assessment shows that in only a very few places does the modest level of water abstraction in the Rhymney Valley have any appreciable effect upon the naturally available flow in the river. At the very localised sites where abstraction has, or appears to have some effect on flows (described below), there are no environmental impacts apparent. There are therefore no water quantity "Issues" in this plan.

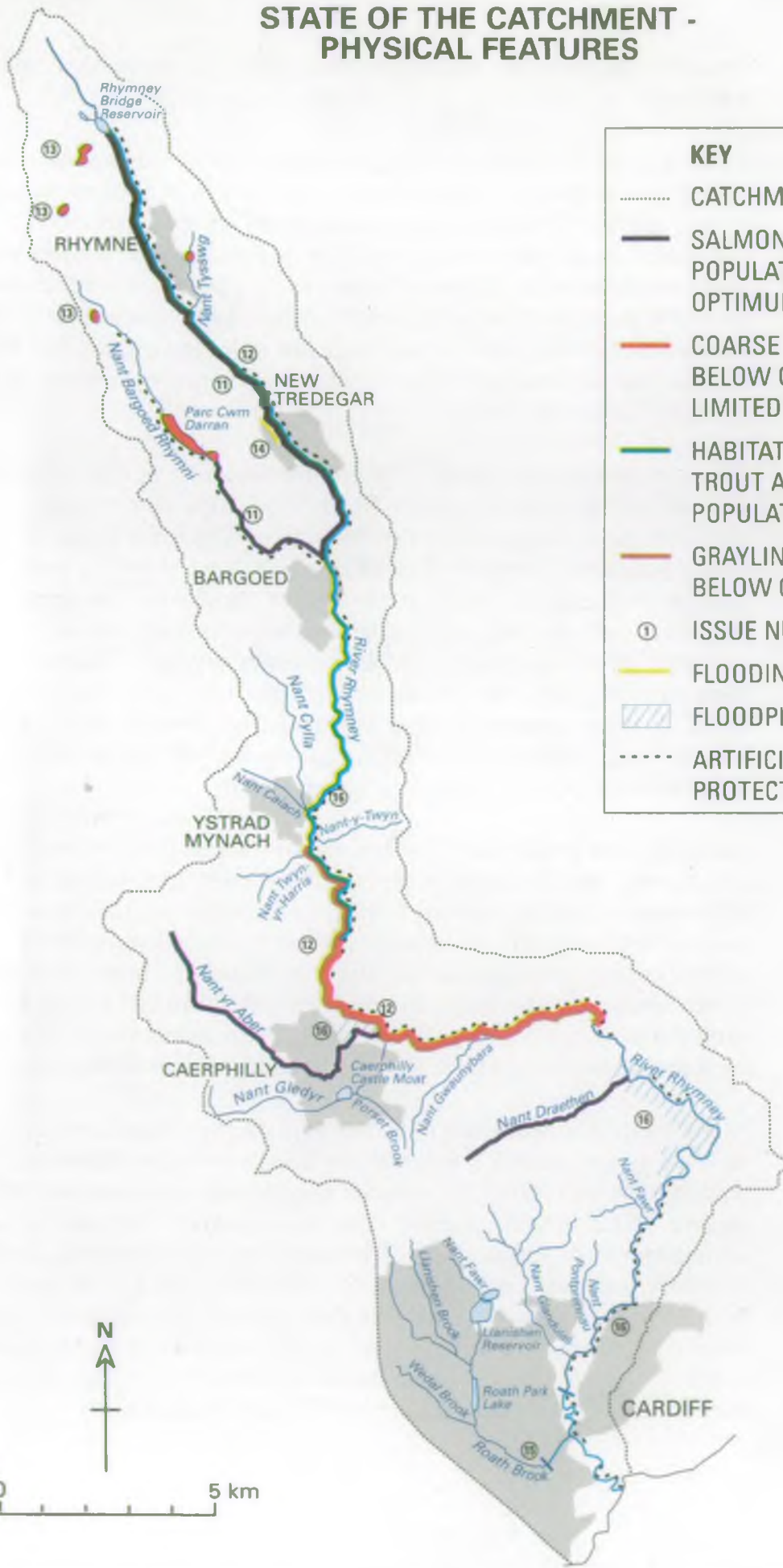
The licences which permit DCWW to abstract water at Rhymney Bridge reservoir and the headwaters of the Roath Brook have no provision to retain a residual flow downstream of the abstraction. The same is true of British Steel's Bute Town reservoir which helps supply the Ebbw Vale works. The lack of compensation flows at these sites can leave the streams dry. However, each dam is sited on small headwaters which are likely to have very little or no flow during typical dry summers anyway. This may require further investigation, but it is certain that there was no natural inflow into Rhymney Bridge reservoir at the height of the 1995 drought. It is not known whether the reservoirs increase the frequency of stream drying, but environmental impacts are likely to be very small.

At the fish farm on the Nant Draethen, the abstraction licence stipulates that the abstractor must leave half of the available flow in the river, and discharge all the water used in the fish farm to the river downstream. This ensures some residual flow in the river, and guarantees that the river flow is restored to its original quantity some distance downstream. However, it does mean that the stretch between the abstraction and discharge points can lose half of its flow, particularly during a dry summer. The site has been monitored for any impact upon aquatic biology and there seems to be no significant detrimental effect.

At the Merle fish farm south of Ystrad Mynach, the Nant Ffrwyd can lose most of its dry summer flow at its confluence with the Rhymney. This section is the only part of the tributary affected and it is contained within a culvert. This culvert is impassable to migratory fish and is of no environmental or amenity use. The fish farm also abstracts from the Rhymney and from a neighbouring borehole. The total loss of water from the river equates to nearly a third of its flow during a dry summer and all the water is returned shortly downstream. There is therefore a highly localised stretch of water where, although there is no known environmental impact, there is relatively little extra resource for further abstraction.

STATE OF THE CATCHMENT - PHYSICAL FEATURES

MAP 6.



KEY	
.....	CATCHMENT BOUNDARY
— (dark blue)	SALMON AND SEA TROUT POPULATIONS BELOW OPTIMUM
— (orange)	COARSE FISH POPULATIONS BELOW OPTIMUM WITH LIMITED FACILITIES
— (green)	HABITAT REDUCED FOR TROUT AND SALMON POPULATIONS
— (red)	GRAYLING POPULATIONS BELOW OPTIMUM
①	ISSUE NUMBER
— (yellow)	FLOODING PROBLEM
▨ (hatched)	FLOODPLAIN AREA
..... (dotted)	ARTIFICIAL BANK PROTECTION PRESENT



3.1.3 PHYSICAL FEATURES

General

Many of the environmental targets for Physical Features are necessarily subjective (Section 5.3) and it therefore follows that their assessment often cannot be precise. Data from many sources including routine fisheries, biological and habitat surveys and special investigations are used to identify areas that are apparently deficient in certain essential or desirable features such as spawning gravels, riparian tree cover or in-river habitats.

Flood risk has been assessed by studying the flood history over the past 25 years and the known distribution of flooding.

The following section and map illustrate the current state of the catchment and identify areas where there are felt to be deficiencies.

ISSUE 8

LACK OF WETLAND HABITATS IN CATCHMENT

Although there is a range of wetland habitats in the catchment they are few in number and limited in extent due to urban and industrial development and agricultural improvement. There may be opportunities to create or restore aquatic habitats as part of new developments or on existing amenity and agricultural land with the collaboration of landowners and developers. Grant assistance, such as that provided by the Welsh Office Agricultural Department Habitat Scheme, may be available in certain circumstances.

ISSUE 9

POOR RIPARIAN HABITAT

A River Corridor Survey undertaken in 1994 confirmed that extensive lengths of river bank on the main River Rhymney are artificially protected (some artificial bank protection was found in 63% of the 500m river lengths surveyed, as shown on Map 6), usually by blockstone works or walls. In other reaches there may be dense vegetation but species and structural diversity is limited due to invasive weeds (Japanese Knotweed occurred in 75% of the 500m river lengths surveyed), even-aged tree structure, grazing and steep banks. Benefits to wildlife could be achieved by modification or appropriate management of riverbanks.

ISSUE 10

INVASIVE ALIEN PLANTS

Japanese Knotweed and Himalayan Balsam are alien plants which are widespread in the catchment. Although they are of benefit to some insects, these species are generally considered to pose a threat to the native flora and fauna. They can also cause problems with the integrity of, and access to, flood embankments and may cause blockage problems in minor watercourses.

Currently, our efforts to control them are restricted to NRA flood defence schemes, although advice on control measures is given when necessary.

The NRA has undertaken research into the control of invasive riparian plants and produced a free advisory booklet for use by others.

ISSUE 11

RESTORATION OF SALMON AND SEA TROUT FISHERIES

Salmon and sea trout populations are recovering both naturally and with the assistance of a modest level of stocking. Stocking of the cleaner nursery streams with salmon and sea trout fry will encourage the subsequent return of adults back to the river but collection of adult broodstock fish and the rearing of their offspring is costly and uses space at our hatchery, which is limited.

The River Rhymney is naturally prone to low water levels after a short period without rain, particularly above Caerphilly. The improvement of river habitat for fish, particularly water depth, cover and diversity could:

- provide more suitable spawning areas
- provide increased nursery area for juvenile fish
- provide increased depth and cover for resting adult fish
- provide increased areas suitable for fishing for salmon, sea trout, brown trout and coarse fish.

The increase in such a valuable resource as salmon and sea trout will lead to problems of illegal fishing. This can be tackled with effective legislation and enforcement strategies. However, resources to combat illegal fishing are continually being restricted. As fish stocks are improving in all the South Wales valleys, it is becoming increasingly difficult to protect these fish stocks adequately.

ISSUE 12

PROTECTION AND IMPROVEMENT OF NON-MIGRATORY FISH STOCKS

Coarse Fish

There are good stocks of coarse fish in the Rhymney, particularly below Machen. There is potential for enhancement of coarse fish stocks and angling facilities between Machen and Ystrad Mynach. This can be undertaken in a number of ways.

1. Stocking of roach, dace and chub to the river, by angling clubs and the NRA.

2. Habitat improvements, ie:
 - Provision of areas of deeper water and better cover to increase holding capacity and fishing area.
 - provision of off-river and backwater spawning and nursery areas to help reduce 'wash out' of coarse fish fry during flash and winter floods.
3. Increased access to the river bank for fishing.

Brown Trout

The Rhymney has a reasonable trout fishery and demand for fishing is satisfied by supplementary stocking by angling clubs. The Rhymney is a very narrow catchment with very short and steep tributaries which are quite limited as trout spawning and nursery streams. The protection and enhancement of trout stocks can be undertaken by:

- protecting and, where possible, increasing the access from the main river to side streams for fish.
- protecting and, where possible, enhancing the instream and bankside habitat quality in tributaries and the main river.
- the provision of more pools in the upper river would increase the productivity and improve fishing conditions.

Grayling

The continued recovery of the grayling populations could be enhanced with further stocking. However, their availability is limited because they are expensive to buy from fish farms, and their cheap availability from wild sources is limited as the historical practice of removing them from English river trout fisheries is reducing. Supplies will be purchased when good value opportunities arise; otherwise the river will continue to recolonise naturally.

Development

The major potential for impact on resident fish stocks is from riverside schemes such as road, housing and industrial developments, land reclamation schemes and flood defence works. Through the planning consultation process the impact of such schemes can continue to be minimised and opportunities for enhancement maximised. It should be stressed that in carrying out any river works, the NRA always includes a financial allowance for environmental restoration.

Fish Mitigation Project

In 1989 there was a pollution incident which caused a very sizeable fish kill on the Rhymney. Compensation has been received from the company involved and a large number of trout, grayling and coarse fish stocked to replace those lost. It has been agreed with local angling interests that further habitat improvements to maintain fish stocks will also be undertaken.

1. Construction of two low weirs in the upper river to create fishing pools.
2. Construction of a lake that will provide coarse fishing and, by connection to the main river, an off-river spawning and nursery area for coarse fish, in the middle of the catchment. This is quite a large project and the scope is likely to be widened in a collaborative scheme that includes Rhymney Valley District Council and the Sports Council for Wales. At the time of writing, the feasibility of several potential sites is being explored. This development is also relevant to the following issue.

ISSUE 13

IMPROVEMENT OF STILLWATER COARSE FISHERIES

There are several stillwater coarse fisheries, principally in the lower catchment, which satisfy the main demand for fishing. There are also several lakes towards the top of the catchment which hold coarse fish but due to their altitude they are cold and exposed, which limits fish growth rate, spawning success and survival.

There is a demand for access to be improved for increased coarse fishing in the upper catchment but there is limited potential for new ponds on the valley floor due to the lack of available land. The provision of a new pond as described in Issue 12 will satisfy some of this demand, but the lack of land has limited the options for sites. The quality of fishing in the upland lakes can be improved by periodical stocking to maintain their coarse fish populations. This can be done by angling clubs purchasing fish for restocking and the NRA providing stocks from other lakes as they become available.

ISSUE 14

FLOODING OF PROPERTIES AT NEW TREDEGAR

Flooding of Birchgrove Flats and the Recreation Centre opposite has occurred in the past. The recently constructed sheltered accommodation blocks just downriver of Birchgrove access bridge, have also been prone to flooding. The District Council have carried out channel revetment works but flood alleviation measures cannot currently be justified because the cost outweighs the estimated benefit.

ISSUE 15

FLOODING AT WATERLOO GARDENS, ROATH, CARDIFF

Flooding from the Roath Brook occurred during the winter of 1994/95. This affected the Harlequin Playing Fields and property in Newport Road. An investigation has been undertaken and a low bridge downstream of the railway embankment has been identified as having influenced the flooding to

some degree. We are currently looking into the feasibility of removing this bridge and carrying out some channel and bank improvements in order to alleviate the problem.

ISSUE 16

FLOODPLAIN AREAS UNDER THREAT FROM DEVELOPMENT

The floodplain is an integral part of the overall river system and we consider it essential that they are kept free from development for flood defence reasons. In addition, we recognise the importance of protecting the existing aquatic environment and heritage features associated with them. Over the next five years, we will be conducting a national survey of flood risk areas (in accordance with section 105 of the Water Resources Act 1991) to further assist Local Authorities in their consideration of planning proposals and the need for flood alleviation works. In the meantime, the areas of floodplain under threat from development are:

- a large area of low lying agricultural pasture land lies opposite the Bedwas House Industrial Estate in Caerphilly on the west bank of the river extending to the base of the Caerphilly by-pass road embankment. This flood storage area would be inundated during a flood and must be retained as undeveloped land to protect the industrial area opposite.
- an area of land bordering the river at Llanrumney has attracted interest from developers in recent years. This area would be inundated during a flood and should be retained as flood storage. Whilst the land may be used for sports pitches or other open area uses, under no circumstances should housing or commercial development be permitted unless the land is raised to a level which accords with our normal requirements for protection against flooding.
- the large floodplain upstream of Cefn Mably Bridge to Chatham footbridge Machen is used as flood storage to offset the effects of the extensive schemes carried out upstream from Machen to Ystrad Mynach. This area should be retained for flood storage and development should be prohibited.
- an area of land on the east bank of the river near Ystrad Mynach which has attracted developers in the recent past. This land, which includes a low lying channel and culvert system constructed as part of the Lower Rhymney Valley Relief Road to allow flood waters to pass under the A472 road, must be retained as floodplain and under no circumstances should development be permitted.

ISSUE 17

DEVELOPMENT BEHIND FLOOD EMBANKMENTS

In areas protected by existing flood defences, land lying behind the flood embankments should not be developed at their existing level. If the land is to be developed then it should be raised to a level which accords with our normal requirements for protection against flooding.

ISSUE 18

MAINTENANCE OF FLOOD PROTECTION SCHEMES AND PROVISION OF ACCESS.

Rivers and watercourses require periodic maintenance and repair. In order that this work can be carried out it is essential that any development allows for a means of access and a working strip alongside the watercourse. NRA Byelaws require that Consent be obtained for any work within 7 metres of the top of a riverbank or within 7 metres of the landward base of a flood defence wall or embankment.

ISSUE 19

RESTRICTION OF SURFACE WATER RUN-OFF FROM NEW DEVELOPMENT

Increasingly developers are having to face the possibility of providing means of restricting the increased rate of surface water run-off from development. This may include storage tanks, ponds or oversized pipes with a suitable restriction on the discharge to the watercourse, and soakaways may also be appropriate. In some cases a combination of all these sometimes combined with watercourse improvements may be feasible. Where such measures are required to mitigate the impacts of surface water run-off, the development should include provision for the long term monitoring and maintenance of these structures. Arrangements under Section 106 of the Town and Country Planning Act 1990 may be appropriate.

3.1.4 CONFLICTS BETWEEN USES

General

Certain conflicts may arise between different catchment uses, irrespective of the catchment's ability to support these uses in terms of water quality, water quantity or physical features. For example, demands placed on the catchment by recreational uses often come into conflict with the need to conserve the wider environment. This section identifies conflicts between uses which are present within the Rhymney catchment.

ISSUE 20

CONFLICT BETWEEN DIFFERENT RECREATIONAL USER GROUPS AND THEIR IMPACT ON WILDLIFE CONSERVATION

Occasionally there is concern over the impact of recreational activities such as angling, canoeing and general public access on the catchment's wildlife conservation. As an example, wildlife groups are often concerned about the impact of angling on wildlife, particularly at high profile locations such as Roath Park Lake in Cardiff. Where necessary, we will assist in resolving issues between different user groups by acting as broker or by providing advice to the owners of facilities or stretches of river.

Canoeing in the Rhymney is, at present, fairly limited. There is potential for growth in this activity but this may occasionally cause conflict with anglers if one user does not respect the interests of the other. Canoeists must also seek permission from the owner of the bankside before launching or landing canoes.

Where there is a demand, we can assist in resolving issues between fisheries and canoeing interests to produce informal access agreements and conditions for canoe touring.

In all but the upper reaches of the main river and tributaries, we have reservations about the suitability of the water quality for water sports activities due to the presence of sewage effluents.

THE IMPACT OF MAJOR DEVELOPMENTS

Major developments can impact on the water environment in many ways. The type of developments include:

1. Roads Schemes
2. Land Reclamation Schemes
3. Large industrial/commercial/residential developments

Where rivers are to be diverted, culverted or otherwise affected, we require the developer to enhance, as far as possible, conservation, fisheries and the recreational value of the river. These developments can often provide an opportunity to restore degraded sections of the river to a more natural state.

Working alongside Local Planning Authorities, the NRA seeks to agree development programmes with the developers to limit environmental damage. It is mainly during the construction stage that environmental problems can arise. Solutions to these problems cannot always be foreseen, and require ongoing liaison during the life of the contract. During preparation and construction, pollution can be caused by surface water run-off contaminated with solids, cement and oil.

A further threat to the water environment comes from any redevelopment or disturbance of contaminated land sites. This could result in the mobilisation or leaching of any contaminants present into the water environment. Schemes will require special precautions to be taken to prevent problems arising from the contaminated land on the sites. The redevelopment of the former Bedwas Colliery/Coke Ovens will require special consideration in this respect.

Where a development may cause major disturbance of former mining areas, grouting is sometimes considered necessary prior to construction. This requires care to be exercised to minimise the impact of grout on surface waters and groundwater resources. This material can travel through cracks and fissures in the ground and enter watercourses or aquifers away from the point of injection.

Major schemes within the categories identified above are indicated on Map 7 in Section 4.1.

One benefit not always considered by developers when determining least cost options is that improvements of the water environment can enhance land values in the locality.

3.2 A SUMMARY OF THE ISSUES AND OPTIONS FOR THEIR RESOLUTION

General

This section of the plan considers options to address the issues that have been raised in the preceding section. The options as presented are the initial thoughts of the South East Area, Welsh Region of the NRA and do not constitute policy statements. We invite you to comment on these issues and options and would welcome any new ideas/suggestions that you may have.

Wherever possible the body responsible for carrying out each option has been identified. In some cases this is identified as an individual(s) or an organisation other than the NRA. However, the options as presented are intended to facilitate improvements to the water environment for the benefit of all users. Their implementation will entail many bodies and individuals co-operating.

In the tables of issues and options that follow, no priority has been assigned to the issues. They are listed in accordance with the current understanding of when the work, or a significant part of the work will be completed. Details of the costs and timetabling of each option will be included in the Action Plan which will be prepared after the full consultation has ended.

ABBREVIATIONS USED IN THE FOLLOWING TABLES:

CSO	Combined Sewer Overflow
CCW	Countryside Council for Wales
DCWW	Dŵr Cymru Welsh Water
k	thousand
LA	Local Authority
NRA	National Rivers Authority

ISSUE No: 1 THE IMPACT OF COMBINED SEWER OVERFLOWS AND INADEQUATE SEWERAGE NETWORK ON WATER QUALITY			
OPTIONS	Responsibility	Benefits	Constraints
1. Continue to identify intermittent or diffuse sources of sewage related pollution.	NRA	Could lead to further improvements to biological and chemical quality.	Costs to NRA and DCWW.
2. Renewal of substandard sewerage system where appropriate.	DCWW	Improved chemical and biological quality. Reduced sewage derived litter.	Costs to DCWW.

ISSUE No: 2 UNKNOWN SOURCES OF IMPACTS ON THE WATER QUALITY OF THE NANT BARGOED RHYMNI, NANT YR ABER AND PORSET BROOK			
OPTIONS	Responsibility	Benefits	Constraints
1. Undertake full biological surveys.	NRA	Identify possible sources causing poor biological quality to enable targetting for remedial work.	Cost to NRA.

ISSUE No: 3 THE IMPACT OF MINEWATER FROM ABANDONED COAL MINES			
OPTIONS	Responsibility	Benefits	Constraints
1. Treat or otherwise remedy minewater discharges.	Collaboration between interested parties as opportunities arise.	Aesthetic, biological and economic benefits.	No legal power at present. Projected capital costs of remedy approx. £730k. Operating costs approx. £75k.

ISSUE No: 4 EFFECTS OF LITTER, FLY TIPPING AND ABANDONED VEHICLES			
OPTIONS	Responsibility	Benefits	Constraints
1. Increase public awareness of litter problem and how to solve it.	NRA/Keep Wales Tidy Campaign/ LAs / Public/ Rhymney & Islwyn Groundwork Trust	Improvements to the water environment. Reduced litter input.	Cost (will be part of £137k Valley Rivers Project).
2. Improvements to CSOs.	DCWW	Improvements to chemical, aesthetic and biological quality of receiving watercourse.	Costs to DCWW.
3. Promote voluntary adoption scheme.	Keep Wales Tidy Campaign	Improvements to water environment. Reduce litter input.	Relies on continued voluntary support.
4. Target litter fly-tipping blackspots.	Keep Wales Tidy Campaign	Reduce litter input.	Costs to group members.
5. Seek co-operation with major retailers to reduce the number of trolleys in watercourses.	NRA/Major retailers	Prevention of flooding.	Cost to NRA.
6. Continue to remove of potential flood risks caused by litter etc..	NRA/Landowner/ LAs	Prevention of flooding. Aesthetic benefit.	Cost. Identification of responsible offenders and owners difficult.

ISSUE No: 5 THE IMPACT OF ILLEGAL CONNECTIONS FROM DOMESTIC PROPERTIES ON THE WATER ENVIRONMENT			
OPTIONS	Responsibility	Benefits	Constraints
1. Confirm the location of pollutions and liaise with local authorities to resolve problems.	NRA/ LAs	Sullage problems found and resolved. Water quality improved.	Cost to NRA/ LAs and householders. Very time-consuming because problems are intermittent.
2. Assess the effectiveness of publicity campaigns and extend their use if considered appropriate.	NRA	Reduced numbers of misconnections.	Cost to NRA.

ISSUE No: 6: DIFFUSE /INTERMITTENT POLLUTION FROM INDUSTRY AFFECTING THE WATER ENVIRONMENT			
OPTIONS	Responsibility	Benefits	Constraints
1. Target inspection of industrial premises.	NRA	Prevention of pollution at source leading to improved water quality	No legislation currently available to enforce eg. bunding of storage tanks at industrial premises. Costs to NRA.
2. Implement pollution prevention measures.	Identified industries	Prevention of pollution at source leading to improved water quality.	Costs to industry.
3. Define Groundwater Protection Zones.	NRA	Determine and prioritise the risks of aquifer contamination.	Cost to NRA.

ISSUE No: 7 THE IMPACT OF PENRHOS TIP ON THE WATER ENVIRONMENT			
OPTIONS	Responsibility	Benefits	Constraints
1. Monitor effectiveness of scheme to intercept and convey leachate to foul sewer.	NRA/ Dyffryn Ffrwd (Newtown) Estates Ltd.	Improved water quality.	Cost to developer and NRA.

ISSUE No: 8 LACK OF WETLAND HABITATS IN CATCHMENT			
OPTIONS	Responsibility	Benefits	Constraints
1. Promote the improvement and creation of wetland habitats via consenting procedures and planning responses.	NRA/LAs	Can include future management needs.	Responding to applications made so not necessarily always meeting conservation priorities.
2. Establish the current distribution of wetland habitats in the catchment.	NRA/CCW/ Conservation Organisations/LAs	Assist in determining priorities and identifying opportunities.	Does not positively promote habitat improvements. Cost.
3. Collaborate with others in habitat improvement and creation projects.	NRA/Others	Achieves positive conservation benefits.	Costs.

<i>ISSUE No: 9 POOR RIPARIAN HABITAT</i>			
OPTIONS	Responsibility	Benefits	Constraints
1. Undertake habitat improvements during flood defence maintenance work.	NRA	Incorporated into routine work. Improves habitat.	Not always in priority areas. Will require agreement of landowner.
2. Promote enhancement measures via consenting procedures and planning responses.	NRA/Landowners	Improves habitat.	Not always in priority areas.
3. Collaborate with others in habitat enhancement projects.	NRA/Landowners	Improves habitat.	Costs.

<i>ISSUE No: 10 INVASIVE ALIEN PLANTS</i>			
OPTIONS	Responsibility	Benefits	Constraints
1. Prepare a Regional policy to determine circumstances in which alien plants should be controlled by NRA.	NRA	Standardised approach to problem.	Costs.

ISSUE No: 11 RESTORATION OF SALMON AND SEA TROUT FISHERIES			
OPTIONS	Responsibility	Benefits	Constraints
1. Stock 10,000 fed fry of each salmon and sea trout per year until 1999.	NRA	Restoration of populations will be accelerated.	Cost of broodstock collection, rearing and stocking estimated at £4k.
2. Stock 30,000 fed fry of each salmon and sea trout per year until 1999.	NRA	Restoration of populations will be accelerated	Cost of broodstock collection, rearing and stocking estimated at £8k.
3. Improve fisheries habitat.	Angling Clubs/ Developers/ LAs/ NRA	Increased holding potential of catchment. Opportunities for and quality of fishing increased (also for brown trout). Restoration of populations will be accelerated.	Cost of construction and time in access agreements.
4. Increased fisheries enforcement patrols.	NRA/Government	Improving fish stocks protected from illegal and over-exploitation.	Additional resources required or reduced patrols on other high quality and improving rivers.
5. Allow fish populations to recover naturally without assistance from stocking.	NRA	Reduced costs.	Slower recovery.

ISSUE No: 12: PROTECTION AND IMPROVEMENT OF NON-MIGRATORY FISH STOCKS			
OPTIONS	Responsibility	Benefits	Constraints
1. Supplementary stocking with coarse fish and grayling between Machen and Ystrad Mynach.	NRA/Angling Clubs	Fish stocks increased.	Costs. Possibility of overstocking if populations not monitored and habitat not improved.
2. Undertake survey of coarse fish and grayling populations and implement regular monitoring programmes.	NRA/Angling Clubs	Status of populations known with greater accuracy.	Costs of electro-fishing programme. Commitment of Angling Clubs to maintain catch records.
3. Ensure developments and river engineering works do not degrade and, where possible, seek to enhance fisheries and habitat via the Planning Consultation Process. Support Section 106 Agreements.	NRA/Developers/ LAs	Fish stocks and habitat protected and enhanced.	Costs. Commitment of developers to undertake enhancements.
4. Encourage catch and release and bag limits for brown trout.	NRA/Angling Clubs	Increased spawning and stocks.	Difficulty in communication links and changing established practices and attitudes.
5. Encourage monitoring of brown trout populations by maintaining catch records.	NRA/Angling Clubs	Status of, and trends in, trout populations known with greater accuracy.	Costs in implementing programme. Commitment of anglers to maintain catch records.
6. Improve instream and bankside habitat for trout populations.	NRA/Angling Clubs	Holding capacity for trout increased.	Costs.
7. Provide sheltered spawning areas for coarse fish (eg. progression of fish mitigation project).	NRA/Angling Clubs	Survival of coarse fish fry increased.	Costs. Lack of suitable sites.

ISSUE No: 13 IMPROVEMENT OF STILLWATER COARSE FISHERIES			
OPTIONS	Responsibility	Benefits	Constraints
1. Progress Fisheries Mitigation Project incorporating fishing lake.	NRA/Angling Clubs	New coarse fishing lake in accessible part of catchment.	Possible cost limitations. Lack of suitable sites.
2. Support initiatives for provision of additional fishing lakes.	NRA/Angling Clubs/ Developers/Owners/ LAs	New fishing facilities provided.	Costs. Lack of suitable sites.
3. Supplement fish stocks in upland lakes by stocking.	NRA/Angling Clubs	Fish stocks maintained where spawning is poor.	Costs to NRA and Angling Clubs. Lack of locally available surplus fish stocks.
4. Provide advice to clubs and owners on fisheries management and improvement of stillwaters.	NRA	Advice provided as required on best practice at sites.	Cost.

ISSUE No: 14 FLOODING OF PROPERTIES AT NEW TREDEGAR			
OPTIONS	Responsibility	Benefits	Constraints
1. Consider a Flood Alleviation Scheme to protect people and property from flooding.	NRA	Reduced flood risk.	Justification on cost/benefit grounds unlikely.

ISSUE No: 15 FLOODING AT WATERLOO GARDENS, ROATH, CARDIFF			
OPTIONS	Responsibility	Benefits	Constraints
1. Investigate source of flooding.	NRA	Quantifies flood risk in area.	Cost.
2. Investigate feasibility of providing Flood Alleviation Works to protect property from flooding.	NRA/ Landowners	Possibility of alleviating flooding.	Cost.

ISSUE No: 16 FLOODPLAIN AREAS UNDER THREAT FROM DEVELOPMENT			
OPTIONS	Responsibility	Benefits	Constraints
1. Restrict development on floodplain.	NRA/ LAs	Reduced floodrisk to adjacent areas. Protect conservation interest. Less need to restrict run-off from upstream development.	Reduction in development areas.
2. Land used for sporting activities only eg football pitches.	LA/Developer	Land used effectively.	

ISSUE No: 17 DEVELOPMENT BEHIND FLOOD EMBANKMENTS			
OPTIONS	Responsibility	Benefits	Constraints
1. Prevent any development.	NRA/ LAs	Avoids serious flooding.	Restricts development.
2. Raise level of land.	LAs/ NRA/ Developer	Allows development.	Cost to developer.

ISSUE No: 18 MAINTENANCE OF FLOOD PROTECTION SCHEMES AND PROVISION OF ACCESS			
OPTIONS	Responsibility	Benefits	Constraints
1. Ensure access is provided in future developments.	NRA/ Developer/ LAs	Access provided for essential routine work.	Cost. Loss of land.

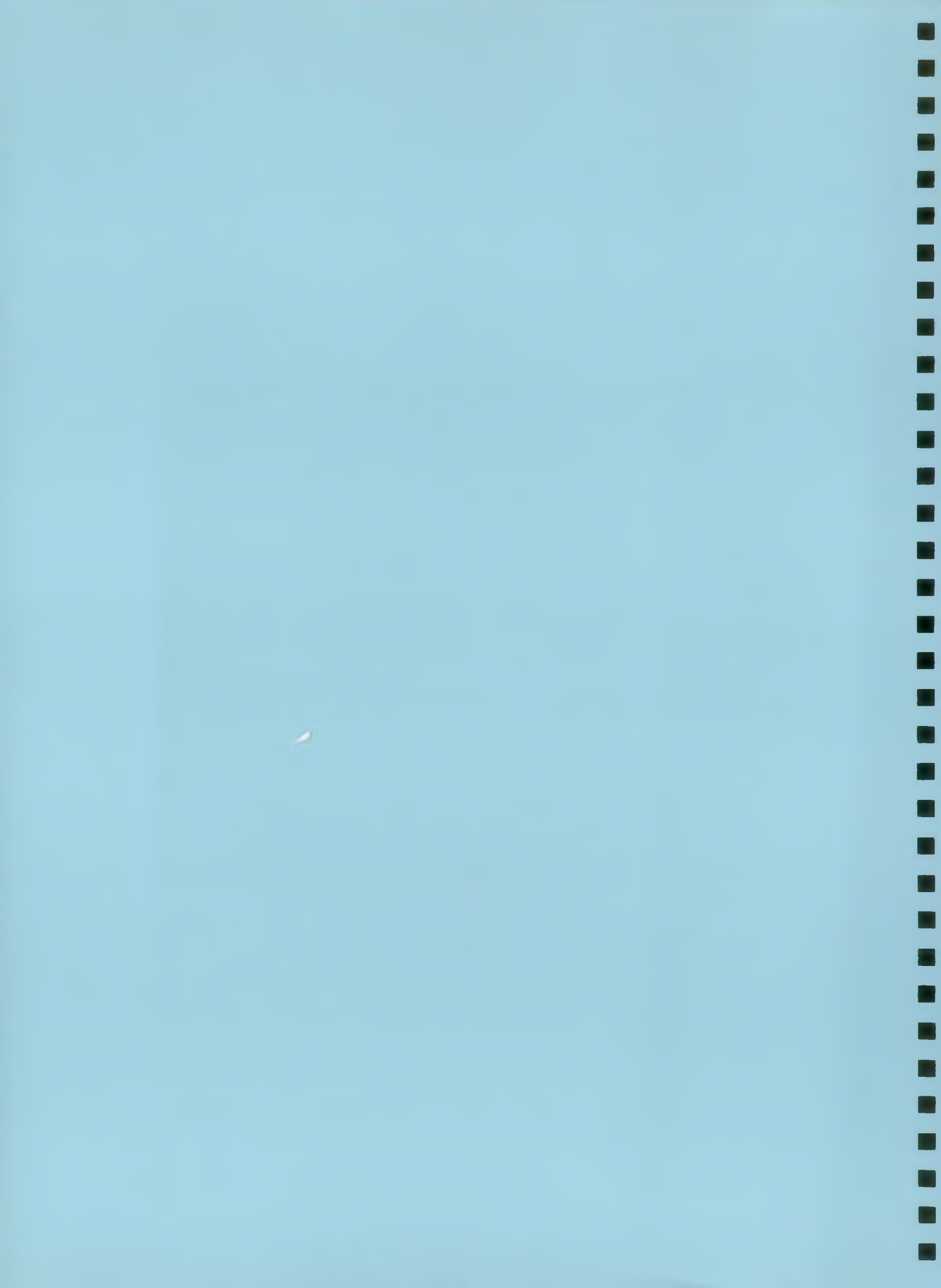
ISSUE No: 19 RESTRICTIONS OF SURFACE WATER RUN-OFF FROM NEW DEVELOPMENTS			
OPTIONS	Responsibility	Benefits	Constraints
1. Provide surface water attenuation or soakaways.	NRA/LAs/ Developer	Protects against flooding.	Cost.
2. Watercourse improvements.	NRA/ LAs/ Developer	Protects against flooding.	Cost.

ISSUE No: 20 CONFLICT BETWEEN DIFFERENT RECREATIONAL USER GROUPS AND THEIR IMPACT ON WILDLIFE CONSERVATION			
OPTIONS	Responsibility	Benefits	Constraints
1. Liaise with angling and canoeing representatives to resolve conflicts and progress access agreements.	NRA/Angling Clubs/Fishery Owners/Riparian Owners/Canoeing organisations	Relationship between canoeists and anglers improved and conflicts reduced.	Costs. Gaining co-operation of different parties.
2. Act as broker and provide advice to site owner and different user groups to resolve conflicts.	NRA/Site Owner/ User Groups	Resources used with minimum conflict and greater mutual understanding.	Cost.

ISSUE No: 21 THE IMPACT OF MAJOR DEVELOPMENTS ON THE WATER ENVIRONMENT			
OPTIONS	Responsibility	Benefits	Constraints
1. Minimise effects of pollution from developments at the planning consultation phase.	LAs/ Developers/ NRA	Protects water environment.	Costs to developer.
2. Monitor and regulate major developments.	NRA	Protect water environment.	Costs to NRA.
3. Promote the restoration of degraded rivers during construction.	Developer/NRA	Enhanced river corridor.	Costs to developer.
4. Encourage the inclusion of enhancement of wildlife, conservation, fisheries and recreation in the reclamation schemes via the planning process on a regular basis..	NRA/Developer/ LAs	Enhances the river corridor benefitting wildlife, public and national heritage. May also enhance land values in the locality.	Costs to developer.

PART II

SUPPORTING INFORMATION



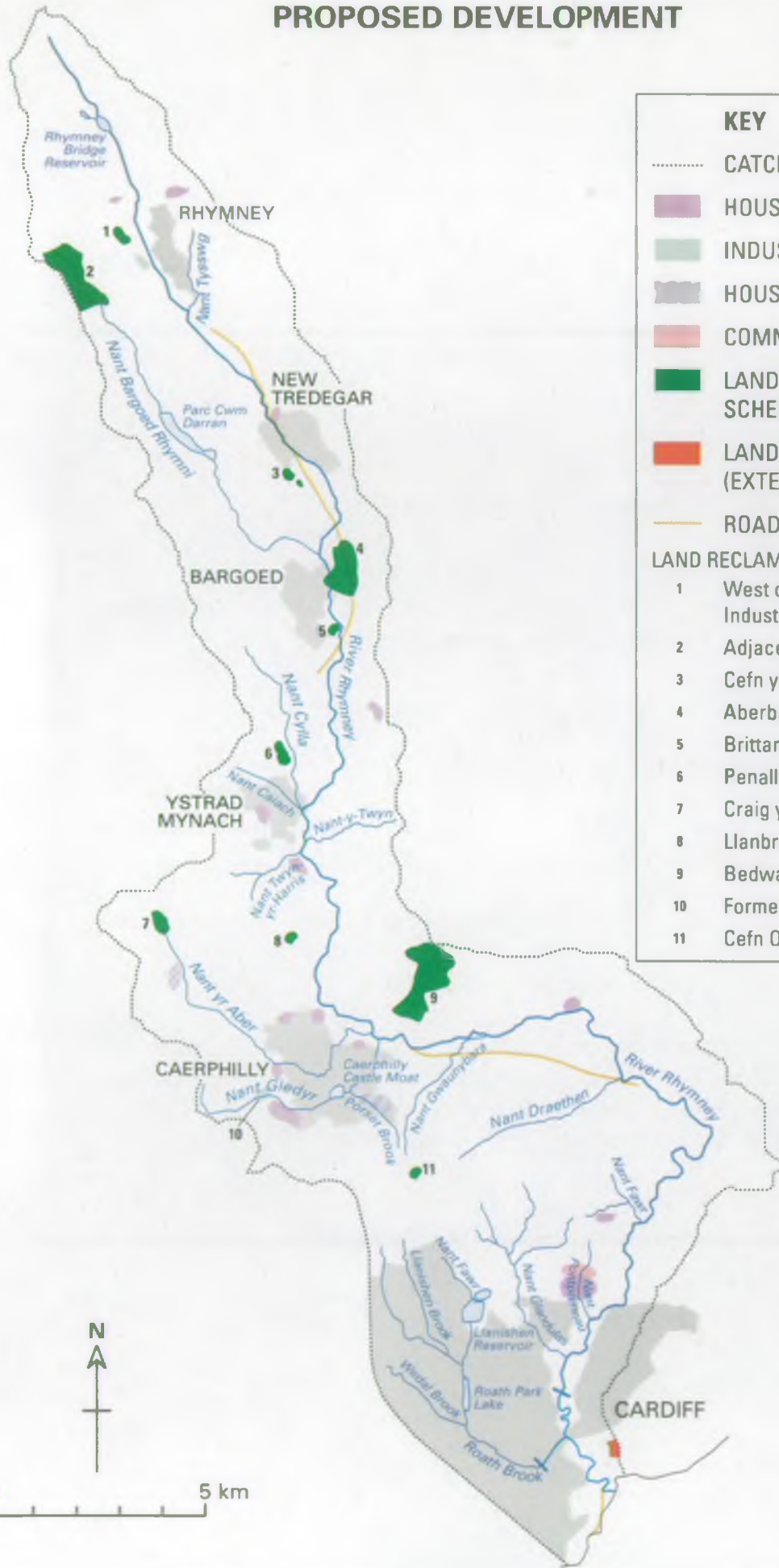
4.0 THE USES OF THE RHYMNEY CATCHMENT

The following sections catalogue the legitimate Uses of the Rhymney catchment which fall under our control or affect us in one way or another.

- The **General information** gives an outline of the nature of our responsibility towards each Use.
- The **Local Perspective** gives more detailed information about the Uses, within this catchment.
- We have set management **Aims** and **Environmental Requirements for each Use**. These are designed to protect both the environment and the needs of other Uses.
- In **Section 5** these specific targets are used to help us set overall **targets**, for the whole catchment, for water quality, water quantity and physical features, that reflect our view of the balance of interests between the different users of water.

PROPOSED DEVELOPMENT

MAP 7.



KEY

- CATCHMENT BOUNDARY
- HOUSING
- INDUSTRIAL
- HOUSING AND INDUSTRIAL
- COMMERCIAL
- LAND RECLAMATION SCHEME
- LANDFILL SITE (EXTENSION)
- ROAD SCHEMES

LAND RECLAMATION SCHEMES:

- 1 West of Heads of the Valleys Industrial Estate
- 2 Adjacent to Rhaslas Pond
- 3 Cefn yr Brithdir
- 4 Aberbargoed and Bargoed Tips
- 5 Britannia Colliery
- 6 Penallta Colliery
- 7 Craig yr Hufen Tip
- 8 Llanbradach Top Tip
- 9 Bedwas Colliery and Tips
- 10 Former Tar Works
- 11 Cefn Onn Quarry



0 5 km

4.1 URBAN DEVELOPMENT (including road and rail)

General Information

The development of the urban or "built" environment is a land use which can affect the water environment and its uses. Such development is generally controlled via the local authority planning process involving the production of development plans and the approval of specific development proposals. The move to plan led development has further increased the importance of development plans.

We attach great importance to the effective influence of the planning process through all its stages. Detailed comments are provided on all development plans and development proposals received by the NRA as a statutory planning consultee. The Authority has produced the document "Guidance Notes for Local Planning Authorities on the methods of protecting the water environment through development plans". Responses to planning consultations often include proposed "planning conditions" which the planning authority may include within a planning approval.

Certain types of development are promoted for approval by other statutory procedures. These include major developments such as roads, railways, airports and barrages. These also are influenced and controlled by early consultation.

A key purpose of this plan is to provide planning authorities and prospective developers with information about the management and use of the water environment in this catchment, our policies and potential environmental constraints including flood risk. This should also facilitate the identification of appropriate development opportunities.

The final decision on development plan policies and development proposals are taken by planning authorities, planning inspectors or the relevant Secretary of State. However government guidance includes reference to the need to fully consider our comments when determining development plans or proposals.

When the Authority objects formally to a development proposal then supporting evidence will be provided at any subsequent Planning Appeal or Public Inquiry.

The NRA's policies for the management of the water environment are based on the sustainability principle. It is hoped that this plan can effectively link with other plans for the built environment so as to provide mutual support for development which is environmentally and economically sustainable.

Local Perspective

The Rhymney Catchment is administered by Mid and South Glamorgan County Councils, Rhymney Valley District Council, Islwyn Borough Council, Cardiff City Council, Newport Borough Council and Brecon Beacons National Park. From April 1st 1996 the Unitary Authorities in this area will be Caerphilly, Newport and Cardiff (see Map 2).

The present status of Structure/Local Plans covering the Rhymney Catchment is as follows :

Council	Plan Type	Coverage	Status
South Glamorgan County Council	Structure	1991 - 2011	Deposit Draft issued January 1995.
South Glamorgan County Council	Minerals Local	1991 - 2011	Deposit document issued March 1995.
Mid Glamorgan County Council	Structure	1991 - 2006	Deposit document issued 1995.
Mid Glamorgan County Council	Minerals Local	1991 - 2006	Deposit Plan issued March 1995.
Rhymney Valley District Council	Local	1991 - 2006	Deposit Plan issued 1994.
Cardiff City Council	Local	1993 - 2001	Deposit Plan - 2nd modifications document issued October 1995.
Brecon Beacons National Park	Local	1996 -2006	Deposit Plan issued June 1995.
Newport Borough Council	Local	1991 - 2006	Interim Policy Document to be prepared for use until Statutory Development Plan produced for Area.
Islwyn Borough Council	Local	1991 - 2001	Due to be adopted early 1996.

The NRA is also involved in the partnership which is developing the Severn Estuary strategy. This agreed strategy will provide the guiding framework for the management of water and landuse in the area of the Severn estuary. It will therefore inform the NRA's catchment management plans, planning authority development plans and the Shoreline Management Plans produced by Coastal Cell Groups. The Strategy is programmed for completion by mid 1998.

Over the last few decades, the pattern of development within the Rhymney catchment has changed. New light industrial/ business parks have appeared throughout the catchment, existing industrial sites have expanded and the road network has either been upgraded or is scheduled for improvement. Some of the road schemes include:

- A465 Hirwaun to Abergavenny - Dualling
- Bargoed Bypass
- Upper Rhymney Valley Relief Road
- Bedwas & Machen Bypass
- Peripheral Distributor Road - Eastern Bay Link

The Bargoed Bypass and Upper Rhymney Valley Relief Road will combine with the existing Lower Rhymney Valley Relief Road.

The Peripheral Distributor Road, when completed, will skirt the built-up area of Cardiff City. The remaining section of this road is the Eastern Bay Link which has been granted planning permission by South Glamorgan County Council. This will serve the employment areas at East Moors and Pengam Green via the Ocean Way and Sea Wall Road interchanges and also bring traffic to the Bay and Central Cardiff from the East.

EU Funds

There are opportunities for the use of European Union funds to improve the environment within the Rhymney Valley. A number of the water related issues identified in section 3.2 have potential to be incorporated within EU funding programmes. This may be achieved directly by the NRA or on a partnership basis with local initiatives. The latter approach has the advantage of combining the development of the built environment with the water environment.

The NRA Welsh Region is keen to progress such partnership initiatives. We are at the moment progressing a Millennium bid jointly with CCW and Welsh Development Agency (WDA). If successful, and with local authority support, this bid will unite the investments in environmental improvements within the valleys of South Wales to produce a much bolder and imaginative initiative to "green the valleys."

Industry

Following the demise of the coal mining industry within this catchment, there has been a broadening of the economic base resulting in the expansion and creation of industrial/business estates.

There are proposed key industrial sites allocated for Tredomen and Penrhos with local industrial estates proposed at Bargoed and Windsor Colliery. Proposals to expand existing industrial sites also exist within the catchment.

Housing

The Rhymney Valley Local Plan currently makes provision for over 5,000 dwellings, some of which already have planning permission. The greatest concentrations are around Caerphilly and Bargoed.

In Cardiff, the completion of the Pentwyn Motorway Interchange and Link Road has released large areas of land for housing and industrial development.

Cardiff Bay Development Corporation has also constructed sea defences to protect the Pengam Green area of Cardiff, which will permit further housing and industrial development.

Infrastructure

Associated with housing and industrial/commercial development is the requirement for adequate surface water and foul sewage disposal. The NRA looks to all the local planning authorities, local drainage bodies and DCWW to ensure that adequate infrastructure is available to accommodate such developments in the Rhymney catchment without causing detriment to the water environment.

Land Reclamation

Land reclamation schemes are proposed for areas such as old colliery sites, tips and derelict land. The Bargoed Colliery Land Reclamation Scheme Phase 1 is currently in progress. This will be followed by a second phase at Bargoed with further schemes proposed at the former Britannia, Bedwas and Penallta Colliery Sites (See Map 7). The proposed after use of these sites includes housing/industry, agriculture and recreation.

These sites are adjacent to watercourses and disturbance of these during reclamation can cause serious water pollution with suspended solids and mobilised leachable components from contaminated land (Issue 21). Run-off contaminated by suspended solids is traditionally controlled by settlement lagoons incorporating oil retention features. Control of soluble pollutants is more difficult but can be achieved, and pollution minimised, by good planning, design and operation.

Minewater Discharges

One particular problem associated with closure of the coal mines in the catchment is that of pollution caused by discharges of iron-rich minewater from abandoned mines (Map 4, Issue 3). This gives rise to discolouration and iron deposits on the river bed. Reclamation and redevelopment of the old mining sites can sometimes provide opportunities to remedy these discharges.

Aims To ensure that development or construction activity does not damage the water environment or detract from its use.

To ensure that development does not affect the water environment so as to threaten life or property.

To promote opportunities within developments that will enhance the water environment and its use.

Environmental Requirements:

Water Quality Development should not adversely affect the water quality requirements of other uses in the catchment.

Development must not cause the failure of any Statutory Water Quality Objective within the catchment.

Developments should be consistent with relevant NRA policies. These include the "Policy and Practice for the Protection of Groundwater", and policy on "Development in Sewered Areas".

Water Quantity To protect inland waters from the detrimental effects of development, including afforestation and other changes in land use.

Physical Features Development should not have an unacceptable flood risk.

Development should not create an unacceptable flood risk in other areas.

Developers must pay for work needed to assess and reduce flood risk.

Development should be consistent with NRA policies, including the Flood Plain Policy (in production), and Policy and Practice for the Protection of Groundwater.

Development should not adversely affect the requirements of other uses in the catchment, including those associated with the conservation of the natural water environment and heritage features.

4.2 FLOOD DEFENCE

General Information

This Use relates to the protection of people and property against flooding from rivers and the sea and primary role of the river as a drainage system for surface water.

Flooding normally follows from extreme climate conditions such as very heavy rainfall causing high river flows and, in coastal areas, surge and storm generated waves combining with high tides. The severity of an individual flood event is generally described in terms of its frequency of occurrence. This is often expressed as a return period in years, for example, 1 in 50 years (i.e. a flood of this severity would, on average, be expected to occur once in a 50 year period).

Areas of land next to rivers known as flood plains or washlands take the additional flow or naturally store water when the channel capacity is exceeded. If significant areas of flood plain are embanked, tipped or built upon the lost storage volume leads to higher river levels elsewhere.

The Coastline of Wales has been divided into a series of Coastal Cells. The boundaries of each cell has been set to reflect the boundaries of the natural physical processes acting on that section of coast. Coastal Groups have been formed containing representatives of each Maritime District Council, the NRA and other bodies with an interest in the management of the Coastline.

Recent Government publications such as the PPG on Coastal Planning and Circular 68/92 Development in Flood Risk Areas, place a requirement on local planning authorities to take account of coastal processes and flood risk in their determinations. The sources of information to assist these decisions will be the S.105 Survey presently under preparation by the NRA and the Shoreline Management Plan as agreed with the Coastal Group formulated from study work undertaken on the physical influences affecting the coastline.

Recent guidance has now been issued by Central Government on the preparation of Shoreline Management Plans to ensure a consistent approach between Coastal Groups.

Flood alleviation schemes are constructed where necessary and cost effective. The standard of protection to be provided is determined by an analysis of the options for the most economically and technically advantageous solution. For a scheme to proceed the benefits in financial terms must outweigh the costs.

The Water Resources Act 1991 requires the NRA to exercise general supervision over all matters relating to flood defence. Powers are also provided for the issue of consents for works on rivers and watercourses designated as Main River and for ensuring the maintenance of flow in river channels and the removal of obstructions.

The Land Drainage Act 1991 (as amended by the 1994 Act) provides the Local Authority and where appropriate Internal Drainage Boards with powers to carry out flood defence works to ensure the proper flow of water. The 1994 Act also provides the NRA with additional consenting powers on ordinary watercourses.

The provision of flood defences including the maintenance of channel capacity, needs to be executed with care if other Uses - notably fisheries and conservation - are not to be affected unduly. Consultations are carried out within and outside the NRA during the formulation and undertaking of schemes. In this way, wherever feasible and consistent with the original purpose, habitat enhancements and the needs of landscape and heritage will form part of the scheme.

The NRA provides and operates a flood warning system on designated main rivers and coastal areas at risk from flooding by the sea. The system provides warnings to the Police who pass the warnings to the general public.

Local Perspective

Defence against flooding is provided in four ways; maintaining river channels, building Flood Alleviation Schemes (FAS), warning people of impending floods and controlling development in floodplain areas.

A summary of the Flood Alleviation Schemes (Map 8) which are largely funded by Glamorgan Local Flood Defence Committee (GLFDC) and Welsh Office follows:

Cardiff

The Rhymney Tidal FAS was constructed during 1960-1970s. It was extended, following tidal flooding incidents in 1981, to include the area between the Docks Link Road and Rumney Bridge. Further improvements were carried out by Cardiff Bay Development Corporation in the early 1990s between Docks Link Road and Eastern District Pumping Station at Rover Way. Roath Brook has tidal defences up to Colchester Avenue and upstream of these the channel contains tidal flows.

Llanrumney

Constructed in the aftermath of the 1979 floods, this scheme extends down the eastern bank of the Rhymney from the footbridge at Ball Lane downstream for some 2 km.

Began This scheme is on the eastern bank of the Rhymney from Llanedeyrn Bridge to Cefn Mably Bridge and protects a large commercial nursery and properties on Began Road.

Machen This scheme was constructed in the late 1980s and extends from Chatham footbridge to the top of Machen village.

Bedwas Constructed in the late 1970s, early 1980s, this scheme extends from downstream of the new Waterloo Bridge to the A468 road bridge near Caerphilly. A new housing development downstream of Bedwas Bridge is protected by a flood defence embankment erected by the developer.

Bedwas House An industrial estate which flooded in 1979 is now protected.

Llanbradach The Cwmlas area at the northern end of Llanbradach was badly flooded in 1979. The scheme was constructed to protect the Cwmlas Housing Estate and extends from Little Farm to downstream of Wingfield Footbridge.

The embankment, which was constructed to protect the Coed y Brain area following the 1979 flood, has now been rendered redundant by the new larger flood defence embankment erected as part of the lower Rhymney Valley Relief Road.

Ystrad Mynach A scheme to protect the industrial site on the eastern side of the river between Coopers Bridge and Tyn-y-Waun Farm and the western side of the river between Coopers Bridge and Ystrad Mynach bridge, was constructed in the mid 1980s.

Caerphilly An improvement on the Porset Brook was carried out in the late 1970s to protect a large housing area to the east of old Bedwas Road. An improvement scheme was also carried out during the late 1960s and early 1970s to facilitate a 'Superstore' development on the northern bank of the Nant yr Aber upstream of Pontygwindy Road and to protect low lying properties on the southern bank. A small scheme in Morgan Jones Park to prevent floodwater from flowing down Mill Road towards Caerphilly was constructed in the late 1980s. Various other schemes have also been undertaken to allow development on the low lying land between Pontygwindy Road (A469) and the Caerphilly Bypass (A468).

The NRA provides a flood warning system for flood risk areas throughout the catchment at New Tredegar, Ystrad Mynach, Llanbradach, Caerphilly, Bedwas, Machan, Began, Llanrumney and Cardiff.

The main areas of flood plain are low-lying agricultural land, outside of the land protected by flood alleviation schemes namely, between Machen and Cefn Mably and between Began and Llanrumney (See Map 8). The floodplain is an integral part of the overall river system and the NRA considers it essential that they are kept free from development for flood defence reasons. In addition, the NRA recognises the importance of protecting the existing aquatic environment and heritage features associated with them.

Aims

To maintain existing flood defences for people and property against flooding from rivers and the sea, taking account of environmental requirements.

To improve the standard of flood defences where appropriate by promoting and constructing new flood defences.

To maintain effective drainage, taking account of environmental requirements.

To provide warnings of imminent flooding to the public (via the police) where appropriate.

Environmental Requirements:**Physical Features**

In protected areas, the flood defences/river bank should not be overtopped by a flood flow within a specified return period.

In areas where land use is primarily agricultural, the watercourse should provide effective drainage, taking account of environmental requirements.

No development should be permitted which would impair the effectiveness of any flood defence scheme or prevent access for maintenance of flood defences.

To ensure where possible that the effectiveness of the flood plain to store and convey flood waters is not impaired.

Adequate arrangements should be provided for flood warning.

Environmental requirements will be taken into account when designing and undertaking flood defence works.

4.3 FISHERIES

General Information

The Fisheries Use addresses the protection, maintenance and improvement of fish stocks within the catchment: angling is covered in Section 4.14 as a recreational Use.

In order to protect different types of fishery the EC Freshwater Fish Directive (78/659/EEC) provides two levels of protection for water quality to support:-

Salmonid fisheries	-	eg. salmon and trout.
Cyprinid fisheries	-	generally referred to as coarse fisheries.

A third category:-

Migratory waters	-	ie. waters that are used for the passage of migrating fish such as salmon and sea trout.
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is largely protected by the provisions of the EC Dangerous Substances Directive which applies to all controlled waters. In addition, standards contained in our policy for the protection of estuarine water are applied to this use.

While the Freshwater Fish Directive can only be applied by statute to certain 'identified waters', the standards it contains will be used informally, for the purposes of CMPs, to assess the whole catchment for this Use.

Water quantity and the physical habitat are also very important factors in the conservation of fish stocks. While these factors do not receive the protection from formal targets, as applied to water quality, the CMP process will help to identify the requirements for their protection in the clearest manner possible.

The control of 'poaching' is a vital aspect in the conservation of fish stocks and we employ a sizeable bailiff force to enforce the legal protection offered to fish stocks by both the Salmon and Freshwater Fisheries Act (1975) and the Salmon Act (1986).

- Local Perspective** The current distribution of salmon, trout, coarse fish and other species is shown on Map 9.
- Salmon & Sea Trout* Salmon and sea trout populations in the Rhymney were wiped out during the industrial revolution by pollution and abstraction. Despite a pollution incident in 1989 which caused a sizeable fish kill, the general water quality improvement in the Rhymney has meant that the population of these fish has been increasing since the 1980s. Unlike many other industrialised rivers there are few obstructions to their migration upstream to spawning grounds so they have good access to all tributaries. The small size of some of the tributaries, though, restricts them from entering and spawning in all tributaries in the catchment.
- Their populations are increasing steadily as a result of natural return and spawning, and a modest level of stocking since 1990.
- Brown Trout* Brown trout are present throughout almost the whole catchment. Populations are good in the mid and lower catchment due to natural spawning from the unpolluted side streams and stocking by angling clubs. Above Bargoed, trout populations are lower due to the reduced size of the river and the effects of low flow during dry periods.
- Trout are also present in a number of lakes, some of which are regularly stocked by angling clubs and owners.
- Coarse Fish* Chub, dace and roach are present from the tidal limit in Llanrumney, Cardiff to Llanbradach where the weirs at Cwmlas restrict their upstream movement.
- Species such as pike, carp and bream, tench, roach and perch are also present in some lakes in the catchment; most notably Roath Park, Caerphilly Castle and Parc Cwm Darran.
- Grayling* The Rhymney is well suited to grayling and this popular fish is present from the tidal limit to Maesycwmmmer in the middle reaches.
- Eels* Elvers enter the river in the spring and adult eels migrate to the sea mainly during the autumn.
- Estuarine Species* A number of estuarine species use the Rhymney estuary for nursery or feeding grounds. Mullet and flounder are the most common species.
- Minor Species* Small species such as bullhead, stoneloach, stickleback and minnow are common in the catchment.

*Freshwater Fish
Directive*

A total of 28.3 km stretches of the River Rhymney and its tributaries are designated as salmonid fisheries (see Map 24) under the EC Freshwater Fish Directive (78/659/EEC).

Aim

To sustain, or assist the recovery of, the populations of wild fish species at the levels appropriate to a catchment of this type and to protect the passage of migrating fish into and from freshwater.

**Environmental
Requirements:**

Water Quality

Rivers

Waters should comply with the appropriate standards under the EC Freshwater Fish Directive (78/659/EEC).

Stillwaters

These waters should comply with the same standards as set for rivers.

Estuaries

These waters should comply with the appropriate standards of the EC Dangerous Substances Directive and the appropriate standards in the NRA policy for the protection of estuarine water quality.

Water Quantity

The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.

Physical Features

An appropriate diversity of natural instream and bankside habitats should be maintained to support the fish typical of the river type.

Appropriate levels of riparian and instream vegetation should be maintained to provide adequate cover for fish.

Artificial barriers should not obstruct passage of migratory fish.

Natural or artificial barriers should not lead to excessive exploitation of fish.

River maintenance and other works should be carried out in a way that causes the least detrimental impact on the fishery.

4.4 RIVER ECOSYSTEM

General Information	<p>The River Ecosystem (RE) Use addresses the protection, maintenance and improvement of the basic water quality required to support different types of river ecosystem (including fisheries). The Use is based on the River Ecosystem Classification Scheme which comprises five classes of water quality of which RE Class 1 has the highest quality.</p> <p>RE Class 1: Water of very good quality (suitable for all fish species)</p> <p>RE Class 2: Water of good quality (suitable for all fish species)</p> <p>RE Class 3: Water of fair quality (suitable for high class coarse fish populations)</p> <p>RE Class 4: Water of fair quality (suitable for coarse fish populations)</p> <p>RE Class 5: Water of poor quality (which is likely to limit coarse fish populations)</p> <p>Further details of the scheme may be found in Surface Waters (River Ecosystem) (Classification) Regulations 1994.</p> <p>This scheme is especially useful for setting objectives which we use as planning targets to manage catchment water quality (see section 5.1).</p>
Local Perspective	<p>The stretches assessed for River Ecosystem are shown on Map 10. All of the River Rhymney and its tributaries lie within classes RE1 and RE2.</p>
Aim	<p>To provide water quality suitable to support a healthy River Ecosystem appropriate to the type of river.</p>
Environmental Requirements:	
Water Quality	<p>Waters should comply with the appropriate standards, applied formally or informally, under the Surface Waters (River Ecosystem) (Classification) Regulations 1994.</p>
Water Quantity	<p>The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.</p>

CURRENT QUALITY AS DEFINED BY RIVER ECOSYSTEM (RE) STANDARDS

MAP 10.

KEY

..... CATCHMENT BOUNDARY

RIVER ECOSYSTEM CLASS

- 1
- 2
- UNCLASSIFIED



Physical Features An appropriate diversity of natural instream and bankside habitat should be maintained to support the Ecosystem typical of this river type.

4.5 GENERAL ECOSYSTEM

General Information

This Use relates to the protection of aquatic flora and fauna along with dependent organisms in the river corridor. In this context, dependent organisms are those which rely, at some stage of their life cycle, on the aquatic and bankside environment.

This basic Use is applied to all controlled waters within the catchment and provides protection to the aquatic environment from substances identified as "Dangerous to aquatic life" under the EC Dangerous Substances Directive. There is also a requirement to protect physical features and water quantity at appropriate levels.

Where areas of the catchment are important for more specific ecological reasons their protection/development is dealt with in the specific Use related chapters that follow and suitable, rigorous water quality standards will be applied.

Local Perspective

The Rhydney and its tributaries are typical upland, gravel-bed rivers, flowing over mixed geological strata. The river follows a largely natural course though some sections have been modified by past industrial development and modern flood alleviation works. Upstream the channel is confined to a narrow valley, but downstream it takes on a more meandering nature.

The combination of the erosive nature of the channel, extensive shading and man-made modifications has resulted in a limited marginal and channel flora with algae and mosses often predominant. Trees and scrub are frequent along the river banks but due to lack of management are often of an even-age structure with consequent lack of habitat diversity. Where grasslands occur they are generally improved and grazed. Other open areas are dominated by tall herbs such as nettles and alien species such as Japanese Knotweed and Himalayan Balsam which are invasive and detrimental to the native flora and fauna.

The aquatic invertebrate community is reasonably diverse with some individual sites and tributaries poorer. The river supports a range of riverine birds including dipper, kingfisher, grey wagtail and heron. Otters are known to have been expanding their range in the catchment since 1989 and the Welsh Otter Strategy identifies the Rhydney as a 'priority' catchment.

The river supports a reasonable population of brown trout and, in the lower river, a varied population of coarse fish. Stocks of salmon and sea trout are increasing.

Aim To protect the basic general ecosystem associated with the aquatic environment and its associated corridor.

Environmental Requirements:

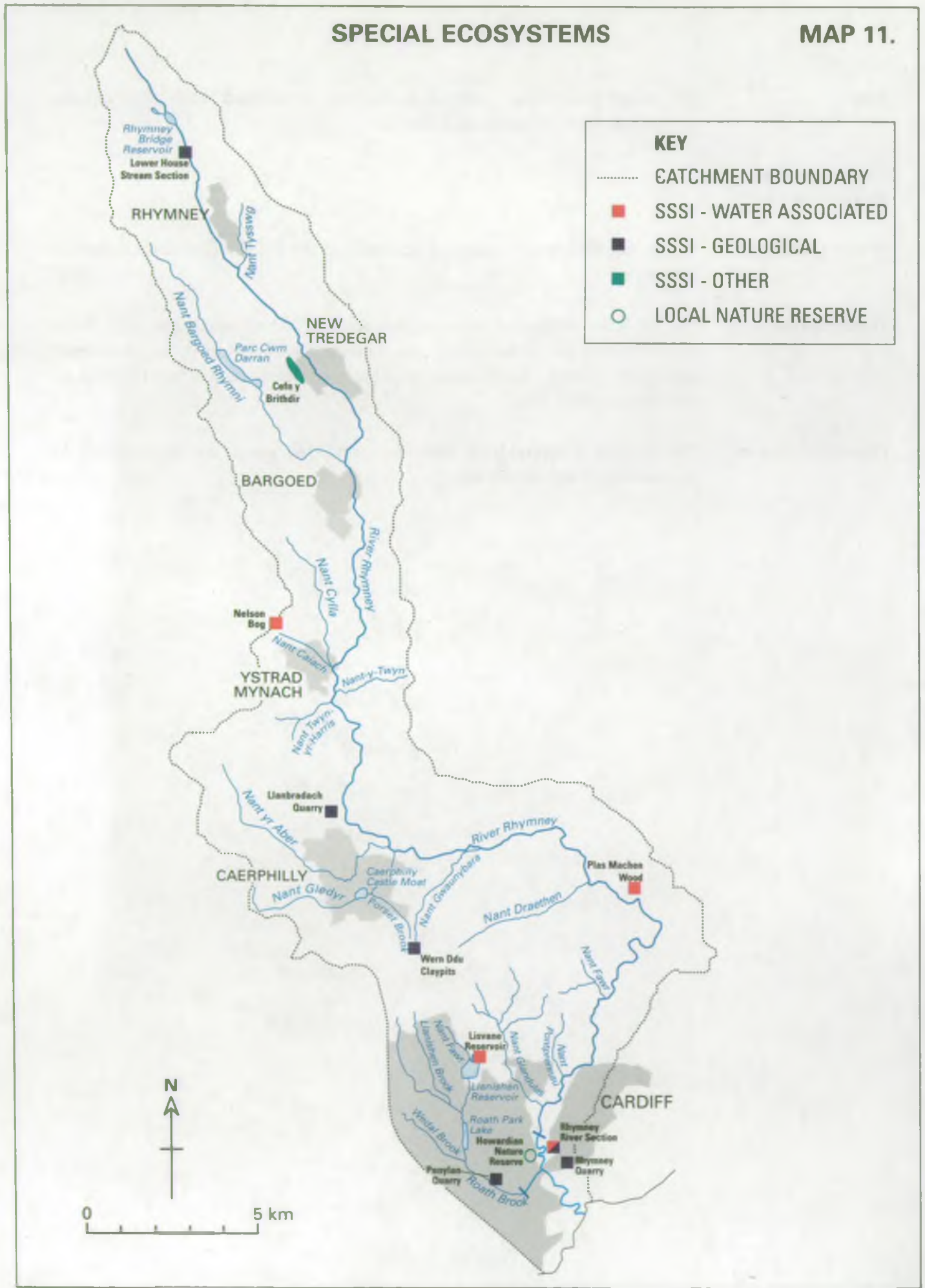
Water Quality Waters should comply with requirements of the EC Dangerous Substances Directive.

Water Quantity The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.

Physical Features The diversity of natural instream features and river plants and animals should be maintained and enhanced.

SPECIAL ECOSYSTEMS

MAP 11.



KEY

- CATCHMENT BOUNDARY
- SSSI - WATER ASSOCIATED
- SSSI - GEOLOGICAL
- SSSI - OTHER
- LOCAL NATURE RESERVE

4.6 SPECIAL ECOSYSTEMS

General Information

Special ecosystems are regarded as those areas that are formally designated for their high conservation value. Such areas include National Parks, National Nature Reserves (NNRs), Sites of Special Scientific Interest (SSSIs) and Special Areas of Conservation and Special Protection Areas designated under the EC Habitats and Birds Directives.

This Use is extended to sites that are valuable in conservation terms but are not formally protected eg. Nature Reserves and County Trust Sites and other non-statutory nature reserves.

It is possible that a WQO for the Special Ecosystems Use will be introduced by the DoE during the lifespan of this Plan. Proposals by the NRA and English Nature are being considered and will be the subject of separate public consultation.

Local Perspective

There are ten SSSIs in the catchment (see Map 11), though only three have an aquatic component; Lisvane Reservoir, which is of ornithological interest, Plas Machen Wood which has a number of streams and waterlogged areas and Nelson Bog which is located on the watershed between the Rhymney and Taff catchments. The majority of the SSSIs are of geological interest but some are exposed by river erosion. The catchment discharges into the Severn Estuary which is an SSSI, Special Protection Area and Ramsar Site. The catchment is adjacent to the the Gwent Levels, an area of historic landscape, archeological and ecological importance (to be covered in more detail in a future CMP).

Howardian Nature Reserve (see Map 11) is the only Local Nature Reserve and is managed by Cardiff City Council.

Aim

To protect the special features interest for which the site has been designated for their ecological or landscape importance.

Environmental Requirements:

Special Conservation Areas are likely to have their own specific environmental requirements for water quality, water quantity or physical features. Currently no designatory agency has identified environmental targets for any sites and, inevitably, consultation would be required before such standards could be implemented.

Water Quality

At sites where water quality is a key factor in the protection of a special ecosystem, appropriate standards will be applied.

Water Quantity

The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.

4.7 CONSERVATION OF NATURE, LANDSCAPE AND HERITAGE

General Information

The protection of the aquatic ecosystem and designated sites for nature conservation are covered in the General Ecosystem and Special Ecosystems sections respectively. This section deals with the broader aspects of the conservation of wildlife, landscape and heritage features associated with inland waters but which may be located away from the river corridor.

The landscape and features of conservation or archaeological interest are of great importance in many catchments and may attract large numbers of visitors.

We have a duty to promote and further conservation of flora and fauna when we carry out our business. This includes the protection of water based or associated plants and animals that are so vital to the water environment. We also have to pay regard to any features of natural beauty or interest and must also consider the desirability of improving access to these features.

Exceptionally beautiful landscapes may be protected by being designated as National Parks or as Areas of Outstanding Natural Beauty (AONBs), for which we are an informal consultee.

Sites of historic or heritage interest may be classed as Scheduled Ancient Monuments (SAMs) or as 'listed buildings' but can be any feature of interest.

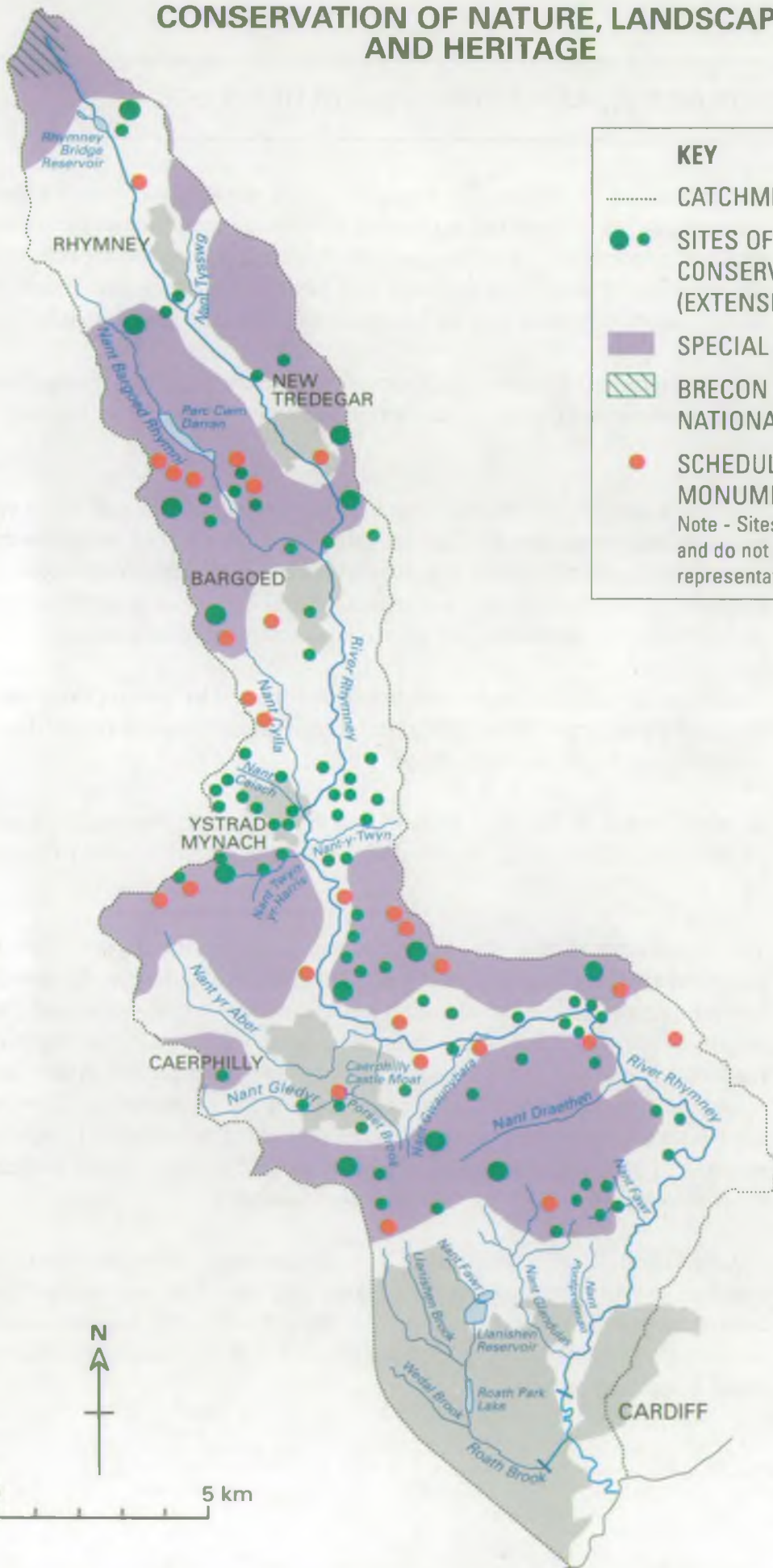
Local Perspective

The headwaters of the Rhymney rise on acid grasslands but flow into urbanised areas within a short distance. In the upper catchment the principal habitat outside urban areas is rough pasture or small oak woodlands, with improved grasslands becoming dominant in the wider valley of the middle reaches. Improved pasture or arable farming predominate in the lower reaches and willows become more abundant at the rivers edge. Elsewhere alder is the dominant riparian tree species, though often restricted to a single row and of a limited size range. In some areas they form part of adjacent relict woodlands.

Aquatic habitats are very limited in number, either as open-water or as marshes or other wetland types. Those that do exist are not generally dependant on the water regime of the river, their water source normally consisting of hillside seepage. An area of saltmarsh lies adjacent to the river in the lowermost section.

CONSERVATION OF NATURE, LANDSCAPE AND HERITAGE

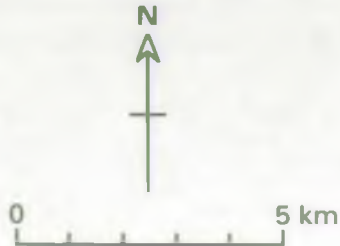
MAP 12.



KEY

- CATCHMENT BOUNDARY
- SITES OF LOCAL CONSERVATION IMPORTANCE (EXTENSIVE, SMALL)
- SPECIAL LANDSCAPE AREA
- ▨ BRECON BEACONS NATIONAL PARK
- SCHEDULED ANCIENT MONUMENT

Note - Sites are indicative only and do not indicate accurate representation of locations



Over 120 Sites of Local Conservation Importance have been identified in the Local Plans, of which 27 have a significant aquatic component (Map 12), the remainder being predominantly woodlands or upland grasslands.

Only the extreme headwater of the River Rhymney extends into the Brecon Beacons National Park though extensive areas of upland along the watersheds of the catchment are designated as Special Landscape Areas in Local Plans (Map 12).

There are several Scheduled Ancient Monuments in the catchment (Map 12) but very few are associated with the aquatic environment. However, it is estimated that only 2 % of archaeological and historic sites have received statutory designation and it is thought that a considerable number of sites have yet to be located. Like most of the South Wales Valleys the River Rhymney was extensively exploited during the industrial revolution and therefore archaeological and historic sites can be expected to be found in proximity to the river.

Aim To ensure that wildlife, landscape and heritage features of interest (particularly designated sites) are protected and, where appropriate accessible.

Environmental Requirements:

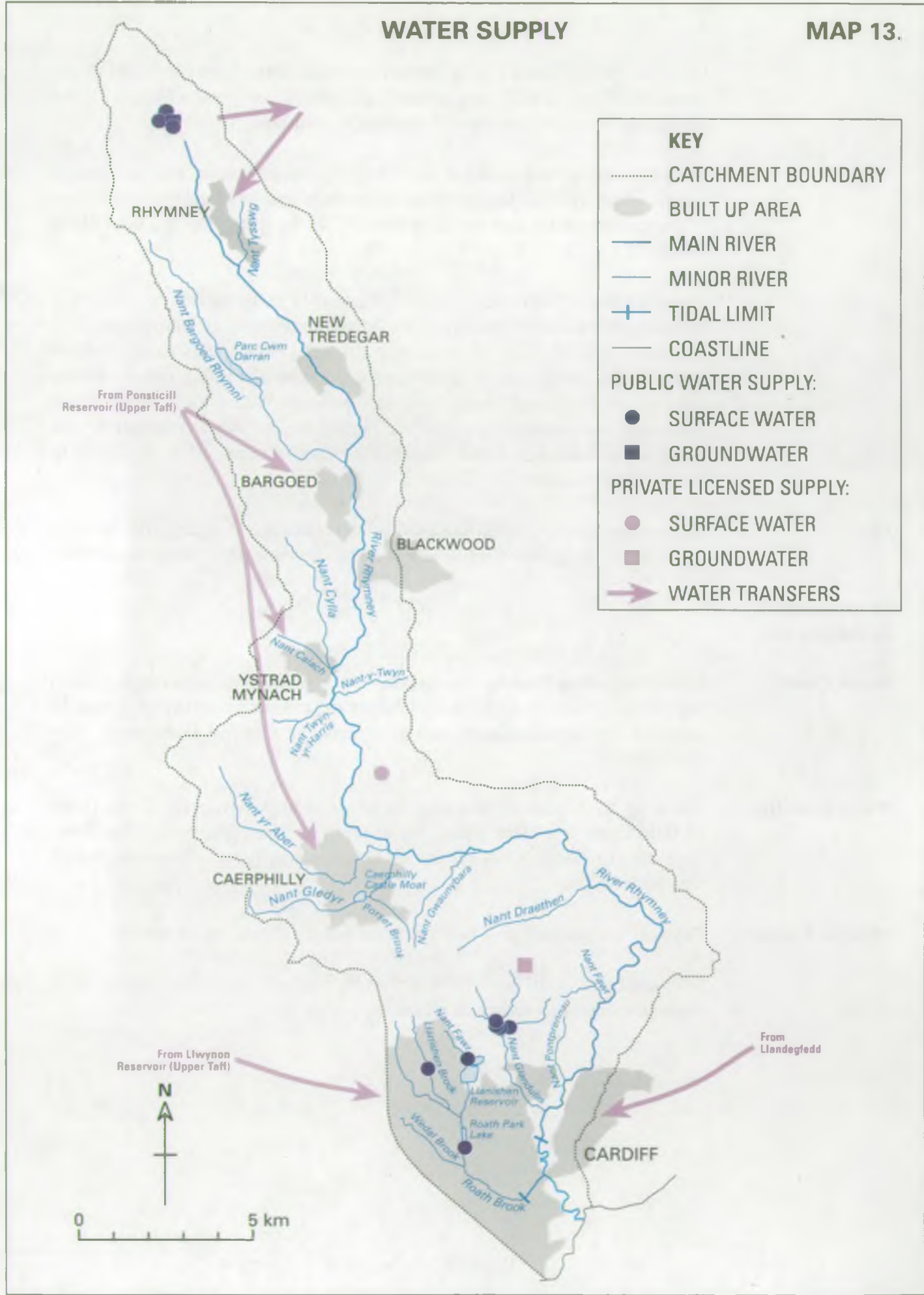
Water Quality Generally there will not be any specific water quality requirements to protect landscape or heritage sites although water around such public places should conform with the standards used to protect the General Ecosystem Use (Section 4.6).

Water Quantity The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.

Physical Features Physical features that give rise to natural beauty should be protected.
Sites and buildings of interest should, where cost-effective, be protected from damage by flooding and/or drought.

WATER SUPPLY

MAP 13.



4.8 ABSTRACTION

General Information

The removal of water from streams, rivers or groundwater by man is termed **abstraction**. The various uses to which the water is put are all grouped under this general heading. Abstractions are controlled by licences granted under the Water Resources Act 1991. The abstraction licensing process ensures that we can manage water resources so as to ensure that the right balance is struck between the needs of abstractors and the environment.

Exemptions from the requirement for a licence include most types of water supplies to a single household, and small (not more than 20 cubic metres a day) general agricultural uses from surface water (excluding spray irrigation) - see table in Appendix 1b. Also, large areas of North and West Wales are exempted from the licensing requirement for abstractions from groundwater (wells and boreholes), regardless of use. There are a number of other specific types of abstraction (eg. firefighting) which are exempt from the need for a licence.

All abstraction licences specify maximum volumes that the licence holder may take, and many contain conditions to protect the environment and other abstractors. The exceptions are licences granted as Licences of Right in 1965, or "Licences of Entitlement" in 1990 where the legislation did not permit us, or our predecessors, to restrict pre-existing abstractions.

In considering applications for new licences, we must ensure that there is no derogation of existing abstractors without their agreement, and that the aquatic environment and associated habitats are properly safeguarded. We do not guarantee that the authorised volume will be available, nor that the water will be fit for the purpose for which it will be used.

We have a duty to protect the quality of water resources and will specify zones or areas around sources that will seek to control certain potentially polluting activities. The Groundwater Protection Policy (Appendix 1a.) forms the basis for our activities relating to groundwater. For surface waters we can apply to the Secretary of State to designate protection zones upstream of major abstractions. In such zones risk assessment could identify whether certain chemicals should be prohibited and/or safety procedures improved so that the abstractions downstream, are protected.

Certain types of abstraction have specific issues associated with them, as follows:

Private and Public Water Supply

Water Companies provide public water supplies mainly from surface waters - rivers, streams and reservoirs - but groundwater sources can be important on

a local scale. The Water Companies have the responsibility to ensure that water supplied by them satisfies statutory standards.

Properties and farms not connected to Water Companies supplies obtain their water from small private supplies such as springs and boreholes. The quality of these sources is monitored by the Local Environmental Health Officer.

Spray Irrigation

Spray irrigation is a high impact use of a water resource and as such is more strictly controlled than other types of abstraction. This is because it takes place during the driest times of year when flows are lowest, and little or no water is returned to the river after use. It is, therefore potentially damaging to the water environment. We encourage winter abstraction into storage and consequently set winter abstraction charges at only one-tenth of those for summer abstraction.

Fish Farming

A fish farm is usually a series of off-stream reservoirs in which fish are reared. This can severely affect a watercourse by diverting a large proportion of the flow through the farm. Although all the water is returned downstream, this does mean that a length of the river is reduced in flow. The requirement for an adequate residual flow to protect the river can restrict the viability of a fish farm.

Water Transfer

Water is not always used in the same place as it is abstracted from. It may be transferred elsewhere, within or outside the catchment. Transfers clearly represent a net loss of water to the immediate area and so their impact is generally mitigated by the release of regulation or compensation water during period of low flows. All transfers are subject to abstraction licences.

Industry

Industrial uses of water range from those where water loss is low - such as mineral washing, to those with high loss - such as evaporative cooling. Most large industrial abstractions take water directly from surface and groundwater, but supplies from the public mains may provide water where quality is important.

Amenity

There is an increasing demand for water to supply a wide range of amenity ponds and lakes to meet needs as diverse as nature conservation and water sports. Water for these ponds and lakes can be taken from ground or surface water supplies and is subject to the normal abstraction licensing procedure.

There may also be a requirement for a discharge and/or land drainage consent.

Ponds created by the damming of a watercourse will generally require an impounding licence.

Many amenity ponds are constructed in flood plain areas and are potentially of concern. We will seek to ensure that such developments and associated works do not affect the natural river regime.

To stop the indiscriminate spread of alien fish species and the spread of disease, all stocking of fish into amenity ponds is subject to our normal authorisation procedures.

Local Perspective

In common with many of the "valleys" catchments of South Wales, the abstractions in the Rhymney catchment reflect a history of industrial use along the valley floor, with agriculture often displaced to the hilltops and valley sides. There are further abstractions for public water supply in the catchment headwaters (Map 13), for irrigation of recreational developments in Roath Park, Cardiff, and on golf courses on the outskirts of Cardiff and Ystrad Mynach. There are also two fish farms with licensed abstractions at the mouth of the Nant Draethen and on the Rhymney south of Ystrad Mynach.

As it is a small catchment and does not receive as much rainfall as the catchments to the west, its quantity of usable water is not as reliable. Consequently the total licensed daily water use is very modest; 67 MI/d when averaged over the crucial summer months. Much of this water is returned to the river, or is taken from reservoir storage, so the present level of abstraction causes very little nett loss of water from the rivers during the dry summer months. Very localised losses may be higher but are still not highly significant.

Around half of the water abstracted is taken for public water supply at Rhymney Bridge reservoir. It is used in conjunction with similar small reservoirs in the upper reaches of the neighbouring valleys to supply the Heads of the Valleys area. During dry periods the inhabitants of the lower Rhymney valley, and many of those higher in the catchment, have to be supplied from the much larger, more reliable sources in the Taff catchment. DCWW can also abstract smaller quantities from the headwaters of the Roath Brook into the Llanishen reservoir for industrial use in the Cardiff area. Once used, all the water supplied to the public in the Rhymney Valley is discharged to the sea by sewer rather than the river.

The industrial abstractions (Map 14) are very varied in character, and include uses such as cooling, paint manufacture and dust suppression. These abstractions are responsible for nearly a third of all water use in the catchment. The water lost from these abstractions varies greatly according to how water is used and whether it is discharged to sewer or back to the river. Industrial water losses have been calculated individually for each licence to accommodate this variation. The total loss, however, is still small, substantially less than the total amount of water used.

General agricultural and domestic water use (Map 15) take very little water (<1Ml/d) and much of it is returned to the catchment through septic tanks. The water is also typically taken from boreholes which do not affect the rivers. The spray irrigation of crops in the lower valley south of Machen, and similar irrigation of golf courses and parks, do cause small water losses (2.8 Ml/d).

Finally, the fish farms in the valley, although using 8 Ml/d in total, return all the water downstream of the farm and so do not contribute to the overall loss of water from the catchment. They do, however, cause some localised loss of flow between the abstraction and the discharge. Small abstractions for fish farms raising fish purely for the table do not require an abstraction licence. The Michaelstone fish farm does not have an abstraction licence and is therefore not marked on Map 15.

There are no hydropower schemes proposed in the catchment.

Aims

To manage water resources so as to safeguard licensed and exempt abstractions and the environment. This includes the active enforcement of abstractions.

To encourage abstractions to be made as far downstream as possible and discharges to be made as close to the point of abstraction as is practicable.

To encourage efficient water use and to optimise re-use of water.

To plan for the sustainable development of water resources, developing criteria to assess the reasonable needs of abstractors and the environment.

Agricultural/Spray Irrigation

To minimise the impact on summer flows of spray irrigation and other forms of nett abstraction.

To encourage winter storage abstraction for use in summer.

Environmental Requirements:

Water Quantity

The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.

Water Quality

There should be no deterioration in water quality, below the point of abstraction, due to reduced dilution of authorised discharges.

Waters abstracted for potable supply should conform with the relevant standards of the EC Surface Waters directive.

4.9 SEWAGE EFFLUENT DISPOSAL

General Information

In Wales most sewage effluent is discharged into freshwaters having first been treated in a sewage treatment works (STW) or smaller facility such as a septic tank. However, some untreated sewage is occasionally discharged into rivers from overflows on the sewerage system. The overflows act as safety valves to stop the treatment works being overloaded or the sewerage system damaged and also to prevent flooding of property. They are designed to operate only under storm conditions when river flows are high. We regulate all these types of discharge and monitor compliance with their consents. In order to protect the water environment these consents may contain conditions that variously specify the quantity, quality or circumstances of effluent discharge. In Wales DCWW handles the bulk of sewage effluent discharged to freshwaters, although the greater number of STWs are privately owned.

Coastal sewage discharges which serve the majority of the population of Wales, are also generally owned by DCWW although at present few of them receive the level of treatment associated with freshwater discharges.

In Welsh Region, the continuing improvements in sewage effluent treatment and disposal facilities feature highly in DCWW's second Asset Management Plan (AMP2), which has been produced in close liaison with us. This plan specifies the capital investment required for DCWW's assets (mainly to ensure compliance with the EC Urban Wastewater Treatment Directive). Consequently, we have, over the past two years, assessed the environmental impact of every DCWW owned STW discharge and those from Combined Sewer Overflows (CSOs) in order to provide a basis for establishing investment priorities. Any sewage effluent related issues identified within this CMP will be considered within the agreed AMP2 programme.

Local Perspective

The Rhymney catchment has a population of over 200,000. The valley is served by a trunk sewer system (Map 16) which collects all the sewage arising from settlements along its length prior to discharging via the Rhymney Valley Trunk Sewer outfall to the Severn Estuary to the east of Cardiff. Under DCWW's current Sewage Treatment Strategy for Cardiff, this flow will be diverted to a facility to be provided on the Cardiff foreshore.

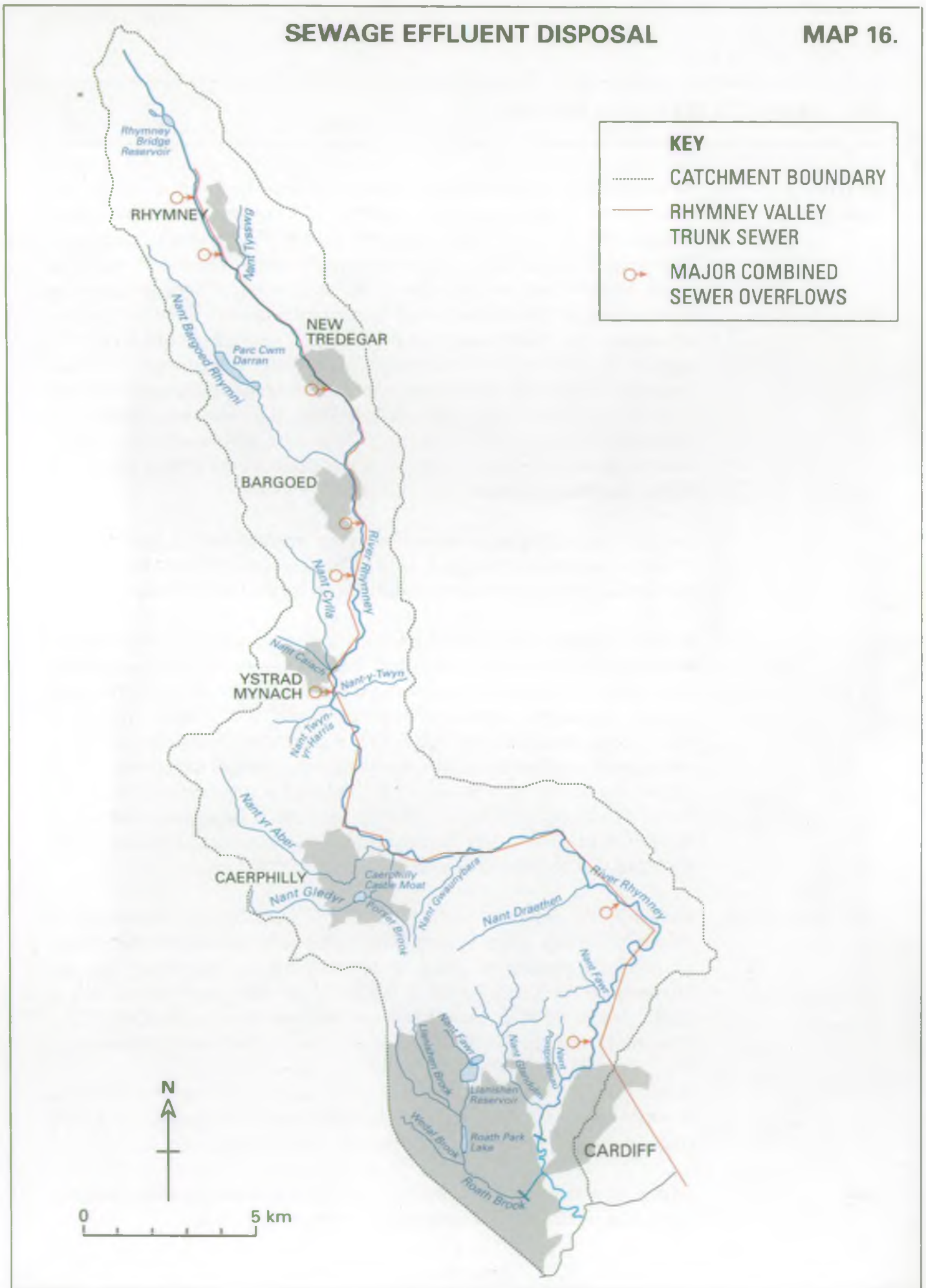
Within the Rhymney catchment there are 78 combined sewer overflows, 66 of which have been assessed to be unsatisfactory according to the AMP2 guidelines and will be prioritised within the programme.

Aims

To prevent pollution that would affect other uses of water by controlling the disposal of treated and untreated sewage effluent and sludge.

SEWAGE EFFLUENT DISPOSAL

MAP 16.



To protect the quality and volume of groundwaters by implementing the NRA's Groundwater Protection Policy.

The NRA would generally seek to ensure that discharges are made as close as possible to the point of abstraction.

Environmental Requirements:

Water Quality Discharges should comply with all conditions stated within discharge consents. This will be enforced by the NRA.

There should be no significant deterioration in the quality of waters receiving discharges, beyond that assumed when setting the discharge consent.

Water Quantity Consent conditions will be derived taking into account the upstream dilution available under average and dry weather flow conditions.

The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.

Physical Features No discharge of sewage from overflows should occur at sewer flows less than those specified in consents.

No reduction in the quality of the physical habitat should occur as a result of the discharge of sewage effluent or construction of the outfall works.

4.10 INDUSTRIAL EFFLUENT DISPOSAL

General Information

In many places it is necessary to dispose of liquid wastes from industry into fresh and coastal waters. However, the material discharged can be highly polluting and close control is therefore vital if the water environment is to be protected.

We use a system of "consents to discharge" to control pollution from industrial effluents, at most sites. However, where a site is subject to Integrated Pollution Control (IPC) any discharges will be authorised by Her Majesty's Inspectorate of Pollution (HMIP), in close consultation with the NRA. Within this framework we will seek to ensure that any authorisation issued is consistent with protecting the Uses of the receiving water and also the broader commitment to the reduction of dangerous materials in the environment. Where pollution prevention measures are stated by HMIP these must also be consistent with our pollution prevention policy.

Trade effluent is discharged to sewers with the permission of the sewerage undertaker (DCWW in Welsh Region) and is then subject to the sewage effluent treatment and disposal controls outlined in Section 4.9.

Local Perspective

Industrial sites are located throughout the valley with the main concentrations at Rhymney, Aberbargoed, Ystrad Mynach, Caerphilly, Bedwas and Cardiff. The estates, which have been established following the decline of the coal industry, have included manufacturing and service industries such as: board, printing, cosmetics, electronics, clothing, food, automotive and electroplating.

The majority of industrial process effluent is now discharged to the foul sewerage network which discharges to coastal waters. Trade waste can enter the river as a result of the intermittent discharges from the CSOs referred to in the previous section (4.9).

There still remains a DCWW water treatment works at Rhymney Bridge which, when operated, would discharge treated filter backwash effluent. It is unlikely that the works will be used in the future. Currently raw water from Rhymney Bridge Reservoir is pumped to Shon Sheffrey Reservoir for treatment at Nant y Bwch WTW.

The traditional problems posed by direct discharge of process effluent have been replaced to some extent by diffuse and intermittent pollution caused by contaminated surface drainage and spillages from the many and varied industrial premises. These are proving, in some cases, to be more difficult to control.

Aims To control the discharge of liquid industrial waste to prevent pollution that would affect other Uses of the water.

Environmental Requirements:

Water Quality Discharges should comply with all conditions stated within discharge consents. This will be enforced by the NRA.

There should be no significant deterioration in the quality of waters receiving discharges, beyond that assumed when setting the discharge consent.

Water Quantity Consent conditions will be derived taking into account the upstream dilution available under average and dry weather flow conditions.

The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.

Physical Features No alterations should be made to the river channel which would reduce the mixing of the effluent and receiving water.

4.11 MINERAL EXTRACTION

General Information

Mineral extraction can affect surface and groundwaters in a wide variety of ways. Discharges from active quarries and mines can contain toxic and suspended materials that are harmful to aquatic life and are subject to the normal discharge consenting procedure described in the Discharge Uses section. However, discharges from abandoned mines are not adequately controlled by the law and may cause locally severe problems.

The exploitation of minerals can have major impact on water resources by altering groundwater flows and hence affecting streamflows. The removal of material from above the water table reduces the opportunity for natural filtering and attenuation of pollutants, which will consequently enter groundwater more readily. Summer springflows can be reduced as a result of the loss of the water storage capacity of the mineral that has been removed. Reclamation with impermeable materials will increase run-off and reduce the recharge of groundwaters by rainfall.

Open cast mining can be of particular concern to us. These mines can also affect the fishery and conservation value of long lengths of diverted river as well as groundwater quality and quantity.

Gravel extraction may take place from the river channel or floodplains and is controlled by planning law, but may also require a land drainage consent from the NRA. If works are not properly managed, the river channel can be seriously damaged by gravel removal.

In some areas land reclamation schemes may cause renewed problems as toxic metals are exposed or fine solids run off into watercourses. Consequently, we license and monitor such discharges.

All mineral workings are subject to general planning control and we are consultees on such applications and consider each application on a case by case basis.

Local Perspective

There is limited mineral extraction within the catchment associated with the coal and quarrying industries (Map 17). Sites include Helid Colliery Opencast Coal Site at Rhymney, the former Penallta Colliery where coal previously extracted and which remained after closure is being removed out of the catchment for blending by Celtic Energy at their Cwmbargoed Disposal Point. The only active limestone quarry within the catchment is located at Machen.

Aims To ensure that mineral extraction and associated activity, including land reclamation, does not adversely affect the water environment.

To protect the quality and volume of groundwaters by implementing the NRA's Groundwater Protection Policy.

Environmental Requirements:

Water Quality All consented discharges must comply with the conditions stated within the consent. This will be enforced by the NRA.

There should be no significant deterioration in the quality of waters receiving discharges beyond that assumed when setting the discharge consent.

Measures must be taken to prevent diffuse pollution that may arise from rainfall run-off.

Water Quantity Mineral working and land reclamation should not have an adverse effect on surface and groundwater resources or the rights of licenced water abstractors.

Physical Features Mineral working, land reclamation and associated activity should not reduce the quality of the physical habitats available in the water environment.

The aesthetic quality of restored landscapes should be in keeping with the overall nature of the catchment and reflect the local needs for amenity and recreation.

4.12 SOLID WASTE DISPOSAL (LANDFILL)

General Information

The disposal of domestic, commercial and industrial waste into landfill sites is a common form of waste disposal in England and Wales. Sites receiving material that is not inert have the potential to produce a toxic liquid effluent (leachate) which can pollute surface and groundwater. Consequently our policy is for all new sites to be designed and operated in a way that contains any liquid effluents. This is monitored by the NRA. Older sites may cause pollution long after tipping has ceased and in these cases, the owner or operator may be required to undertake remedial works.

Waste Regulation Authorities (WRAs) presently issue (Waste Management) licences to handle waste or operate a waste disposal site under the Environmental Protection Act 1990. The NRA is a statutory consultee on applications for all landfill waste management licences.

Local Perspective

There are two active landfill sites receiving domestic and commercial waste at Trehir in Caerphilly and Lamby Way in Cardiff (Map 17). The primary discharge route for leachate from Trehir is the Rhymney Valley Trunk Sewer with a storm facility to the River Rhymney permitted when the maximum volume to sewer is exceeded during periods of heavy rainfall. Lamby Way discharges leachate to the River Rhymney estuary. There are also a significant number of sites in the catchment licensed for the disposal of inert waste. Properly operated, these do not pose a threat to the water environment.

At Trehir, on present rate of input, the life of the tip is estimated to be five years. At Lamby Way, an eastern extension is proposed which will give a further 12 years of life at the present tipping rate (if the recycling and anaerobic digestion proposals prove to be successful, the life could be extended). This extension will be an engineered site with leachate collection and discharge to the new Cardiff Eastern Sewage Treatment Plant when completed.

Aims

To ensure that waste disposal sites are designed and operated in a way that does not adversely affect other uses of surface water or groundwater.

To protect the quality of groundwaters by implementing the NRA's Groundwater Protection Policy.

Environmental Requirements:**Water Quality**

Waste disposal sites must be designed and managed to prevent liquid effluent from adversely affecting the quality of surface water and groundwaters.

All Waste Management sites must comply with the conditions included in the licence, enforced by the WRA.

Sites must comply with the conditions included on any discharge consent or prohibition notice, issued and enforced by the NRA.

Water Quantity

Waste disposal activities must not harm groundwater resources or adversely affect the rights of water abstractors.

The NRA's Position Statement regarding landfill and waste management can be found in the document "Landfill and the Water Environment".

Physical Features

Windblown litter from waste disposal sites must not be permitted to create an aesthetic problem in adjacent rivers, estuaries or coastal waters.

Following the cessation of tipping, all aftercare provisions stated on the planning consent, or licence surrender conditions, must be carried out by those responsible.

4.13 BASIC AMENITY

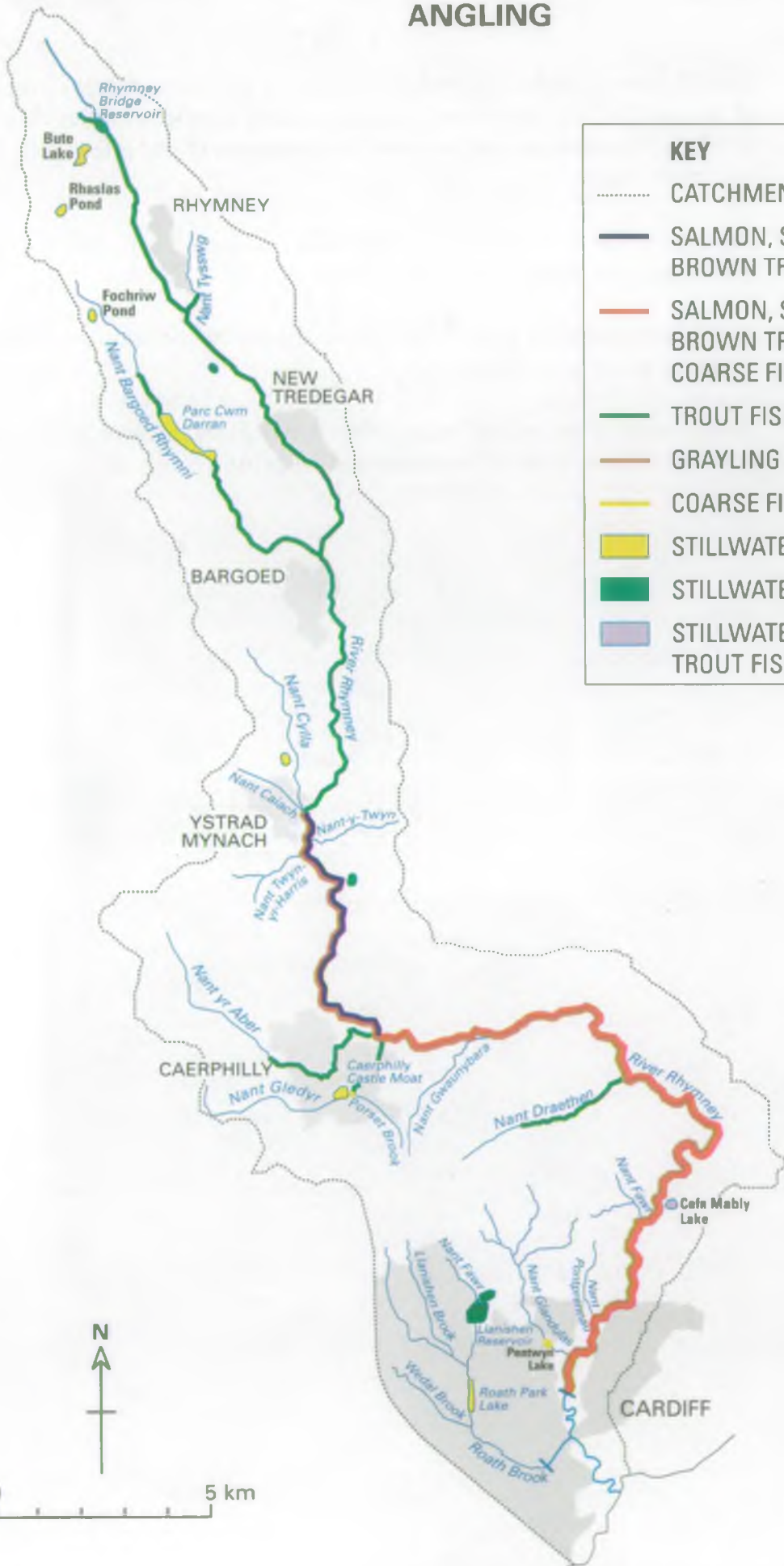
General Information	Basic amenity relates to those activities that are principally land based but could by their nature, attract people to the river environment. Examples include walking, picnicking and bird watching. The main areas of concern are therefore the general aesthetic acceptability of the river corridor, access and public safety.
Local Perspective	<p>Basic amenity in the Rhymney catchment is associated largely with the areas of open countryside alongside or close to the river system.</p> <p>A network of strategic footpaths is emerging linking the Rhymney Ridgeway Footpath to a section of long distance footpath and proposed footpaths south of Bargoed, and crossing the mountain shoulder of Cefn-y-Brithdir. A long distance riverside footpath from Machen to north of Rhymney is also underway.</p> <p>Cycle routes link Bargoed and the Darren Valley and a new network is proposed to link settlements within the Rhymney Valley.</p> <p>The Darren Valley offers camping and caravanning, angling, walking and picnicking facilities in an attractive country setting.</p> <p>There are country parks proposed between Hengoed and Penallta, at Bargoed and Bedwas for informal recreation including walking and picnicking.</p> <p>Other sites of amenity value include the country parks and woodland walks and picnic sites to the south of the catchment and there are a number of golf courses in the catchment.</p>
Aims	<p>To maintain the watercourse so that the public enjoyment of bankside environment is not impaired.</p> <p>To provide safe and easy access to the waterside without unreasonably constraining other Uses.</p>
Environmental Requirements:	
Water Quality	Water quality should be maintained at a level appropriate to prevent aesthetic nuisance.

Water Quantity The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.

Physical Features An appropriate network of riverside paths and access points should be maintained and, where appropriate, promoted.

The development of recreational sites should be promoted at suitable locations as opportunities arise.

Development of recreational uses of the catchment should take account their potential impact on the environment and other uses.



KEY

- CATCHMENT BOUNDARY
- SALMON, SEA TROUT AND BROWN TROUT FISHING
- SALMON, SEA TROUT, BROWN TROUT AND COARSE FISHING
- TROUT FISHING ONLY
- GRAYLING FISHING
- COARSE FISHING ONLY
- STILLWATER COARSE FISHERY
- STILLWATER TROUT FISHERY
- STILLWATER COARSE AND TROUT FISHERY

4.14 ANGLING

General Information

This section deals with the recreational activity of fishing with rod and line, rather than the protection of fish stocks. The latter are dealt with in the Fisheries section.

In many ways the requirements for angling are very similar to those for the basic amenity use. However, we do have formal responsibility towards angling, and issue rod licences that are a legal requirement for fishing for any freshwater fish. The income generated by licence sales contributes to fisheries management costs.

Traditionally, in Wales, game fishing for salmon and trout has been the predominant form of freshwater angling, although coarse fishing for other freshwater species is locally popular in many areas. Angling for sea fish takes place at many sites covered by Catchment Management Plans. However, we have neither control of, nor responsibility for, sea angling and it is not covered specifically in CMPs.

Local Perspective

Angling takes place throughout much of the catchment (see Map 19) in a number of lakes, and in the main river and larger tributaries where there is enough water to hold 'takeable sized' fish. Fishing rights on tributaries and main river below Caerphilly are mostly in private ownership. The main river above Caerphilly is mostly owned by local authorities. There is a high demand for angling from the large population in the catchment.

Salmon and sea trout fishing occurs mostly in the lower river, below Machen though it does extend up to Ystrad Mynach. Sea trout can be caught from June onwards, but the majority of salmon enter the river from September and beyond the end of the fishing season in mid October.

Trout fishing takes place in the main river and larger tributaries. Several angling clubs stock with trout from reared fish farms to supplement natural stocks. River trout fishing is particularly popular with children in the river above Caerphilly.

The Rhymney is noted locally for its grayling fishing in the mid and lower reaches. We have stocked grayling in recent years to compensate for pollution incidents and to enhance populations.

River coarse fishing takes place between Cardiff and Caerphilly. It is very productive in certain areas where there are deep pools, particularly below Machen. Chub, dace and roach are the main species. Their populations have increased over the past 20 years due to stocking (mostly by angling clubs and some by us) and reductions in river pollution.

There are a number of stillwater fisheries catering for a variety of needs in the catchment. There are 'put and take' trout fisheries at Llanishen reservoirs in Cardiff, Cefn Mably, Ffrwd near Ystrad Mynach and a new development at New Tredegar. Popular coarse fishing lakes exist at Roath Park lake and Pentwyn Pond in Cardiff, Cefn Mably, Caerphilly Castle, Penallta and Parc Cwm Darran. Several ponds at the head of the valley, eg. Bute Lake, Rhoslas and Fochriw Ponds hold limited stocks of coarse fish. Their altitude and exposure restricts their productivity but they help to satisfy a local demand for coarse fishing.

These river and lake fisheries provide recreational fishing with steadily increasing quality for game and coarse anglers, and for pleasure, match and specimen anglers. Roath Park Lake has been used as a venue for international coarse fishing matches in the past.

Aim	To ensure that the water environment can sustain angling at least at its current distribution and quality.
Environmental Requirements:	
Water Quality	Water quality should be maintained at a level appropriate to prevent aesthetic nuisance.
Water Quantity	The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.
Physical Features	Safe access to and from the waterside should be promoted. The waterside features required for angling should be maintained and developed.

4.15 WATER SPORTS ACTIVITY

General Information	<p>Waters used for sports and recreation fall into two broad categories; Identified Bathing waters and Water Contact/Recreational Use waters. Each category is treated separately below.</p> <p>It is possible that in the future this Use will be included within the proposed scheme of Water Quality Objectives being developed by the DoE.</p>
Identified Bathing Waters	<p>To be identified by the Department of The Environment (DoE)/Welsh Office (WO) as falling within the terms of the EC Bathing Waters Directive (76/160/EEC), several criteria are taken into consideration including: high numbers of bathers, first aid facilities, lifeguards and toilets. Identified waters are required to achieve the standards in the EC Directive and are sampled according to the DoE/WO guidelines during the bathing season (May to September inclusive). In Wales, these are exclusively saline waters.</p>
Water Contact/Recreational Use Waters	<p>All waters where water sports occur, other than identified bathing waters, fall into this second category. These could include rivers, stillwaters, estuaries and coastal water and may support activities such as canoeing or water skiing where total immersion is likely, or other non-immersion based recreation. Bathing may also take place. It should be noted that we do not recommend bathing in freshwaters.</p>
Local Perspective	<p>There is a very limited level of water based recreational activity in the river and stillwaters of the catchment (Map 20).</p> <p>Canoeists occasionally use the river, but the level of activity is low and, because of the small size and shallowness of the river, limited to periods when river flow is above average. Access to the river for canoeing is subject to permission of the riparian owner.</p> <p>At Roath Park lake Cardiff City Council provide boats for recreational use from Easter to October.</p>
Aim	<p>To ensure that the catchment is maintained to an appropriate standard to support bathing in Identified Waters, and other water sports to at least their current levels of use at existing locations.</p>

Environmental Requirements:

Bathing in Identified Waters:

Water Quality At Identified Bathing Waters (EC Directive), water quality should conform with the standards contained within the EC Bathing Waters and the EC Dangerous Substances Directives.

Physical Features Promotion of safe and easy access to and from Identified Bathing Waters.

Water Contact/Recreational Use Waters:

Water Quality Where marine waters are used for immersion sports, including bathing, we are guided on appropriate standards to protect public health by MAFF and local Environmental Health departments. We are unable to set bacteriological standards in CMPs for freshwaters where immersion sports or bathing take place, but waters should comply with the requirements of the EC Dangerous Substances Directive.

Water Quantity The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.

Physical Features To protect and, when possible, improve access to contact/recreation waters.

4.16 NAVIGATION AND BOATING

General Information

Navigation is considered to be the use of pleasure and commercial craft in waters that fall under our general control, where a right of navigation exists. This includes the maintenance of navigation aids (such as buoys, perches and marks) which are required for the safe passage of vessels.

In Wales the navigation authority is usually the local port or harbour authority who will liaise with us. However, in the Dee estuary we are the navigation authority. Elsewhere in tidal waters we have neither control over, nor responsibility for navigation.

While we are not the navigation authority for either of the two freshwater rights of navigation that exist in Wales we may under certain circumstances introduce byelaws to control navigational use of a river. We must also pay regard to the needs of those rights of navigation that do exist.

Boating is regarded as the use of boats for pleasure, rather than commercial purposes, and includes rowing, sailing and powered boats where no significant water contact is involved. Where no right of navigation exists, access to and use of the water is by formal or informal agreement of the land/fishery owners and our concern is principally for the participants' enjoyment of the activity.

Local Perspective

There is no public right of navigation in the freshwater length of the River Rhymney (see Map 20). Like most rivers, there is a right of navigation from the estuary up to the tidal limit. There is no Navigation Authority in the Rhymney estuary

There is a boating club situated on the Rhymney estuary. A number of pleasure craft are moored in and use the estuary, as a shelter from and access to the Bristol Channel. These boats are affiliated to the yacht clubs. Mooring fees are paid to the Crown and South Glamorgan County Council.

Aims

To ensure that waters in the catchment can support boating and related activities to at least their current levels of use at existing locations, provided there is no detriment to other uses.

To encourage and support canoe access agreements on the River Rhymney.

Ensure that works to the river channel do not prejudice these activities as far as is practicable.

Environmental Requirements:

Water Quality Water quality should be maintained at a level appropriate to prevent aesthetic nuisance.

Water Quantity The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.

Physical Features Where waters under the control of the NRA are used for navigation no obstruction to the passage of vessels should be created.

Any maintenance of navigation channels or aids to navigation should take into account other uses of the water.

Areas used for boating should be protected from development that would constrain this use.

The encouragement and promotion of safe access points for boating, where appropriate.

Features required for navigation or boating should be maintained and enhanced where appropriate. This would include adequate freeboard and freedom from obstructions.

4.17 AGRICULTURAL ACTIVITY

General Information

The processes and by-products of agriculture are a major potential threat to the water environment, especially in more intensively farmed areas. Our key areas of concern include:-

- pollution by animal and other agricultural wastes;
- contamination of groundwater and surface waters by fertilisers and other agro-chemicals;
- the effects of land drainage on water tables and water courses;
- the impact of uncontrolled stock grazing on river banks;

Where there is a specific discharge of effluent from a farm site this will be dealt with via the general discharge consenting process described in the discharge uses sections. However, the highly polluting nature of agricultural waste normally precludes this option and our approach is aimed at control at source by minimising the volumes of effluent produced and stored. Often it is background pollution caused by large numbers of diffuse discharges that causes the most significant impact and these are of greater concern to us. Consequently we have worked closely with farming organisations to develop waste handling guidelines that seek to control this type of pollution. The Authority can also enforce legal minimum standards for new silage, slurry and agricultural fuel oil installations. In key areas our programme of farm visits helps to alert farmers to potential and existing problems.

We issue codes of practice for the use of fertilisers, herbicides and pesticides, to protect the water environment and, in certain places (Nitrate Sensitive Areas), may control the application of fertilisers to protect groundwater supplies.

Farmers are encouraged to fence riverbanks to prevent uncontrolled access by stock. Cattle and sheep can severely damage riverbanks in a way that can lead to channel instability, increased flood risk and a marked reduction in the fisheries and conservation value of the river.

Fish farming can severely affect a watercourse by diverting a large proportion of the flow through the farm, leaving a length of the river reduced in flow. The requirement for an adequate residual flow can restrict the viability of a fish farm.

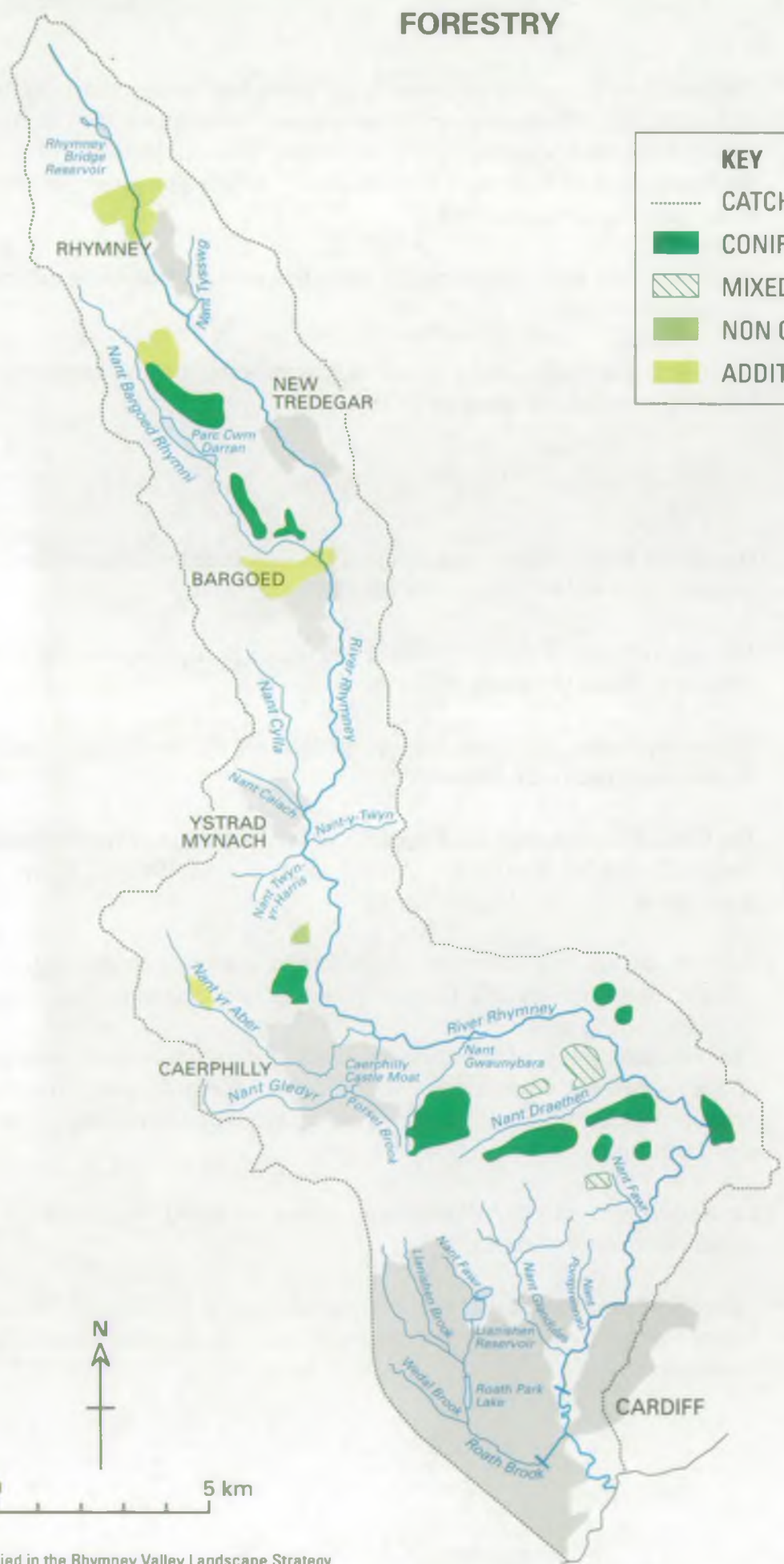
Local Perspective	The main farming activity is located in the lower half of the catchment, south of Caerphilly. There are dairy units scattered throughout the catchment, whilst in the Michaelstone-y-Fedw area there is a concentration of market gardening, growing vegetables and tomatoes. There is also some fish farming in the catchment (see section 4.21).
Aims	<p>To protect the water environment from the potential adverse effects of agricultural activity.</p> <p>To protect the quality and volume of groundwater by implementing the NRA's Groundwater Protection Policy.</p>
Environmental Requirements:	
Water Quality	<p>Discharges should comply with all the conditions stated within the discharge consent. This will be enforced by the NRA.</p> <p>The codes of practice for the handling and use of Pesticides, Herbicides and Fertilisers should be strictly followed.</p> <p>Where applicable, the management practices set out for Nitrate Sensitive Areas should be strictly followed.</p> <p>The Code of Good Agricultural Practice for the Protection of water should be complied with as should the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991.</p> <p>Agricultural activities must be designed and managed to prevent liquid effluent from adversely affecting the quality of surface and groundwaters.</p>
Water Quantity	The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.
Physical Features	<p>Land drainage activity should not adversely affect the fishery and conservation value of rivers.</p> <p>Agricultural processes should not lead to a reduction in the quality of physical habitats of fishery and conservation value nor increase river instability or flood risk.</p>

FORESTRY

MAP 21.

KEY

- CATCHMENT BOUNDARY
- CONIFEROUS WOOD
- ▨ MIXED WOOD
- NON CONIFEROUS WOOD
- ADDITIONAL PLANTING*



*As identified in the Rhymney Valley Landscape Strategy

4.18 FORESTRY

General Information

Well managed woodland in the right places does not harm the water environment and will often bring benefits. However, in certain circumstances forestry development and management can cause problems. Areas of concern to the NRA, nationally, include acidification, soil erosion, pollution, water yield, increased flooding risks and damage to wildlife habitats.

While we have duties and powers to regulate some forestry works, overall regulation of forestry is the responsibility of the Forestry Authority. In recognition of the potentially harmful impact of poorly managed forest development, the Forestry Authority has published The Forests and Water Guidelines, against which all forest operations are assessed.

We are currently consulted on a non-statutory basis on applications for new planting under the Woodland Grant Scheme (where considered necessary by the Forestry Authority) and in relation to acid sensitive areas documented in the Forest and Water Guidelines. However, we are seeking improved national links with the Forestry Authority to achieve a consistent and effective approach to the general environmental assessment of forestry schemes and operations, including felling and restocking.

To ensure that the water environment is properly considered, we will continue to liaise with Local Authorities, the Forestry Authority and local forest managers about the production of Indicative Forest Strategies, and general forest management issues.

Local Perspective

There are almost 85 km² of forest plantations within the catchment operated by Forest Enterprise. This represents 36% of the total catchment area. None of the catchment is identified as being sensitive to acid waters as defined in the NRA forestry policy. Nevertheless, we have recently scrutinised Forest Enterprise's long term proposals and provided appropriate comments.

Aims

To protect the water environment from the potentially negative effects of forestry activities.

To encourage forestry practices that improve the water environment.

Environmental Requirements:

The Forests and Water Guidelines should be followed.

4.19

NET FISHING FOR SALMON, TROUT AND EELS

General Information

This Use is principally concerned with the use of nets and other types of gear to catch migrating eels, salmon and trout. Other than sea fish, migrating adult salmon and sea trout are the main quarry for net fisheries in Wales and these are restricted to coastal waters and estuaries. The number of these fisheries is closely controlled by Net Limitation Orders and Byelaws which are designed to conserve stocks. We license salmonid net fisheries within the terms of the Orders and enforce Byelaws. In many places the fishing techniques allowed reflect local culture, and consequently in Wales there is a very wide variety of fishing methods employed. These range from coracles and nets to ranks of fixed traps, called putchers, which have significant heritage interest.

We also license net fishing for eels. While there is no limit to the number of licences that can be issued, we specify certain methods that can be employed, and may refuse to issue a licence for a location if we feel that fish stocks could not support the fishery, or that the migration of salmon and trout could be impaired.

Local Perspective

There are no licences to fish commercially for salmon or sea trout within the Rhymney Estuary. There are 8 licences to use drift nets to catch salmon in the Bristol Channel. Their downstream limit for fishing is a line due south of the Rhymney estuary.

There is a limited elver fishery which operates in the Rhymney estuary during spring. Several licences are issued for fyke nets for eel fishing on the Cardiff foreshore to the west of the river mouth.

Aim

To ensure that net fishing takes place in a manner that does not over-exploit fish stocks or interfere with other legitimate uses of the water environment.

Environmental Requirements:**Water Quality**

Water quality should be maintained at a level appropriate to prevent aesthetic nuisance: fish stocks are protected by the provisions within the Fisheries and River Ecosystem Uses (Sections 4.3 & 4.4).

Water Quantity

The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.

Physical Features To enforce the provisions of the Net Limitation Orders and Byelaws to ensure that stocks of salmon and sea trout are not endangered by net fishing.

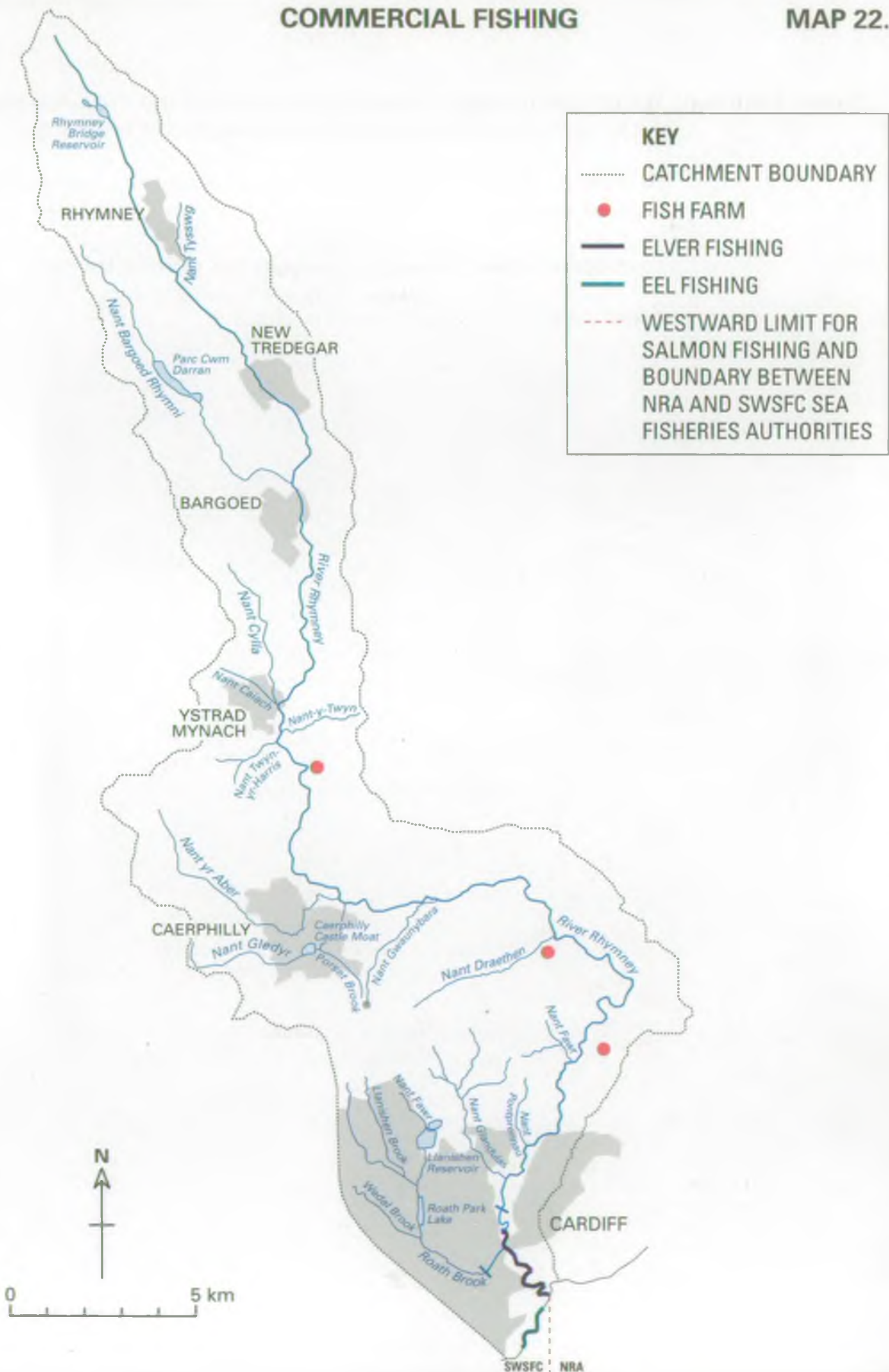
To license and regulate net fishing for eels and non-salmonid freshwater fish to protect stocks.

To minimise conflict between the requirements of different fisheries.

Access points for net fisheries should be protected.

COMMERCIAL FISHING

MAP 22.



General Information

Commercial fishing for sea fish and shellfish is controlled by a variety of laws and EC Directives. The NRA has some responsibility for each type of fishery although we often share this with others, such as Local Authorities, Sea Fisheries Committees and the Ministry of Agriculture, Fisheries and Food (Welsh Office Agriculture Department, in Wales).

Sea Fisheries

Sea fisheries are regulated by local Sea Fisheries Committees who control fishing sites and methods using bylaws that are drawn-up, where appropriate, in consultation with us.

In Wales the Welsh Office monitors fish stocks and catches and is responsible for the registration of fishing vessels and enforcement of quotas.

Environmental Health Departments monitor the health and quality of fish flesh.

While we have responsibilities in some coastal waters our main concern is the protection of migrating salmon and sea trout, although in some places we have powers (by agreement with local Sea Fisheries Committees) to enforce the protection of bass stocks in coastal waters.

Shellfisheries

Like sea fisheries, shellfisheries (not including crabs, lobsters and other crustacea) are regulated by several different authorities, including the NRA. The shellfish are protected by the provisions of the EC Shellfish Waters Directive that allows us to protect and monitor water quality in designated shellfisheries. However, the Menai Strait is the only commercial shellfishery in Wales that has been designated under this Directive.

Shellfish are known to concentrate materials such as toxic algae, metals and pathogenic bacteria which can be harmful to people who eat them. Thus the quality of shellfish harvested for sale for human consumption is protected by the EC Shellfish Hygiene Directive that is administered by environmental health departments and MAFF (Welsh Office Agriculture Department, in Wales). So far about 30 sites in Wales have been designated under this directive.

Local Perspective

There is no commercial harvesting of sea fish or shell fish in the Rhymney estuary. In the Bristol Channel there is some fishing for flatfish and cod using fixed nets on the foreshore. The NRA regulate the sea fishery to the east of the Rhymney estuary. To the west, sea fishing is controlled by the South Wales Sea Fisheries Committee (SWSFC).

- Aims** To maintain and where possible enhance, marine and shellfisheries.
- To protect migrating salmon and sea trout from interference by marine fishing activities.
- Environmental Requirements:**
- Marine Fisheries:**
- Water Quality** Discharges to coastal waters should be controlled to meet the requirements of the EC Dangerous Substances Directive.
- Physical Features** Marine fishing activities should not interfere with the migration of salmon or sea trout.
- The physical marine environment should not be altered in a manner that would affect migratory fish stocks.
- To enforce statutory measures that protect bass and other sea fish stocks, where appropriate.
- Shellfisheries:**
- Water Quality** Discharges to coastal waters should be controlled to meet the requirements of the EC Dangerous Substances Directive.
- Water quality at shellfisheries designated under the EC Shellfish Waters Directive should comply with the appropriate standards. The Shellfish Hygiene Directive has no associated target classes and therefore no Environmental Requirements can be set.
- Where a recognised commercial shellfishery has not been officially designated under the EC Shellfish Waters Directive, we will, for the purpose of setting informal targets for Catchment Plans, be guided by the provisions of that directive.
- Water Quantity** The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.

4.21

FISH FARMING

General Information

Fish farming has especially close links with the water environment and requires large volumes of clean water that are later discharged as effluent. Consequently, there is a large potential for adverse environmental impact. Thus all fish farms must be registered with the Ministry of Agriculture Fisheries and Food (Welsh Office in Wales) and we issue licences to abstract and consents to discharge effluent for freshwater fish farms (marine farms may require a consent to discharge, depending upon circumstances). Careful management of fish farms is required by all involved to control the impact and our particular concern is to prevent the spread of disease, alien species or strains of fish to wild stocks and to maintain free passage for upstream and downstream migrating wild fish.

Fish farming can severely affect a watercourse by diverting a large proportion of the flow through the farm, leaving a length of the river reduced in flow. This requirement for an adequate residual flow can be a factor that restricts the viability of a fish farm at some locations.

Local Perspective

There are three fish farms in the Rhymney catchment (Map 22). At Riverside trout fishery near Ystrad Mynach, brown trout and rainbow trout are reared for stocking to lakes and rivers. At Draethen and Michaelstone fish farms rainbow trout are reared for stocking and for the table.

Aim

To control fish farming activity to protect wild fish stocks and other uses of the water environment.

To manage the quality and volume of watercourses so as to safeguard licensed and exempt abstractions and the environment. This includes the active enforcement of abstractions.

The NRA will encourage abstractions to be made as far downstream in a river as possible and discharges to be made as close to the point of abstraction as is practicable.

Environmental Requirements:**Water Quality**

Discharges should comply with all conditions stated within the discharge consent. This will be enforced by the NRA.

There should be no significant deterioration in the quality of waters receiving discharges, beyond that assumed when setting the discharge consent.

Water Quantity

The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.

All conditions stated on the abstraction licence must be complied with; this will be enforced by the NRA.

Physical Features

That suitable provision should be made to prevent the escape of stock to the wild and the trapping of wild stock within the farm. Where appropriate this will be enforced by the NRA. Similarly provision should be made to prevent the spread of diseases and alien species.

5.0 CATCHMENT TARGETS

In this section we set targets for:-

- Water Quality
- Water Quantity
- Physical Features.

These targets reflect the needs of the Uses identified for any area of the catchment and are set using the guiding principles of:-

- Sustainable development
- Environmental capacity

5.1 WATER QUALITY TARGETS

General

Section 4 of this report identified the many Uses to which the Rhymney catchment is put, and the appropriate water quality requirements of each Use. These requirements provide the basis for setting targets to ensure the protection of legitimate Uses.

Targets are commonly derived from water quality standards contained in relevant EC Directives such as those concerning Dangerous Substances, Freshwater Fisheries and Bathing Waters. These targets are applied on a statutory basis in certain parts of the catchment. Elsewhere we may informally apply standards contained within appropriate EC Directive to provide planning targets for the protection of legitimate Uses.

SWQOs

Provision for setting Statutory Water Quality Objectives (SWQOs) in controlled waters was made under the Water Resources Act (1991). The scheme is based on recognised Uses to which a river may be put and includes River Ecosystem, Potable Abstraction, Agricultural/Industrial Abstraction and Watersports. At present only standards for the River Ecosystem Use have been formally developed and were introduced by the Surface Waters (River Ecosystem) (Classification) Regulations 1994.

The Government is currently conducting a pilot implementation of SWQOs following which it is hoped they will be applied more widely. Until then objectives proposed using the River Ecosystem scheme in this CMP will remain informal. They will however, form the basis of our approach to water quality management (replacing the National Water Council scheme).

Where Uses are not supported by formal water quality standards we may set informal targets to protect a particular Use. These then provide additional water quality planning targets. Such standards have been developed for example to protect migratory salmonid fish in estuarine waters.

Local Perspective

Groundwater

Aquifers are difficult to clean once contaminated. These resources will be safeguarded by the implementation of the Policy and Practice for the Protection of Groundwater. Our groundwater target is to establish a groundwater quality monitoring network by sampling water from boreholes within major, or locally important, aquifer systems.

Surface Water

The River Rhymney from source to the tidal limit has been assigned a River Ecosystem target class of RE2 along with the tributaries, Nant Bargoed Rhymni and Nant yr Aber (see Map 23). This is felt to be a realistic target for

CATCHMENT TARGETS

an urban catchment influenced by intermittent discharges from CSOs. Many of these CSOs are known to be unsatisfactory and not designed to modern standards. They have a much greater impact on the biological quality of the river than on the chemical water quality (see Map 4). The completion by DCWW of their Rhymney Valley Trunk Sewer CSO improvements will allow the river quality targets to be reassessed in the future.

The targets for the Nant Cylla include a stretch above the former Penallta Colliery site assigned a target of RE2 with the remaining stretch to its confluence with the River Rhymney assigned a target of RE3.

The stretches designated as Salmonid fisheries under the EC Freshwater Fish Directive are indicated on Map 24.

5.2 WATER QUANTITY TARGETS

General

The implementation of the Water Resources Act 1963 required almost all types of abstraction to be authorised by a licence. Pre-existing abstractions had to be granted a Licence of Right in 1965 that reflected the historical abstraction regime and could not take into account its impact. Subsequently, licences have been granted only if they do not adversely affect existing abstractors and the environment, or if conditions can be imposed which restrict their impact.

We take a precautionary approach to the granting of new licences, and will only grant them if we are confident that the available resources are able to sustain the proposed abstraction in the long term without harm to the environment or existing abstractors. We also regularly monitor the compliance of abstractors with licence conditions and enforce them as necessary.

We will adopt an abstraction licensing policy that will allow us to consider, in a structured way, the environmental needs of the river system and to balance these with the needs of abstractors. The policy will permit a review of the volume of existing abstractions in the catchment.

A methodology for the assessment and prioritisation of rivers that suffer artificially reduced flows is already in use. In Welsh Region we will use Catchment Management Plans to assist this process.

We will seek to balance the needs of existing and potential abstractors with those of the environment.

We have powers to limit abstraction and take other conservation measures in periods of drought.

Flow Requirements

To prosper, the natural river ecosystem requires a certain flow, minimum flow or pattern of flows. While research towards identifying these specific needs is underway, an interim minimum flow has been set. On most rivers this is equivalent to the flow that would, on average, be exceeded for 95% of the time (Q95). Although new abstractions would not generally be permitted to cause flows to drop below this level, rivers will naturally fall below it from time to time.

Water Level Requirements

At some designated wetland conservation sites we will agree Water Level Management Plans, with the Countryside Council for Wales and/or English Nature, to manage water levels to meet the needs of the protected ecosystem.

Local Perspective

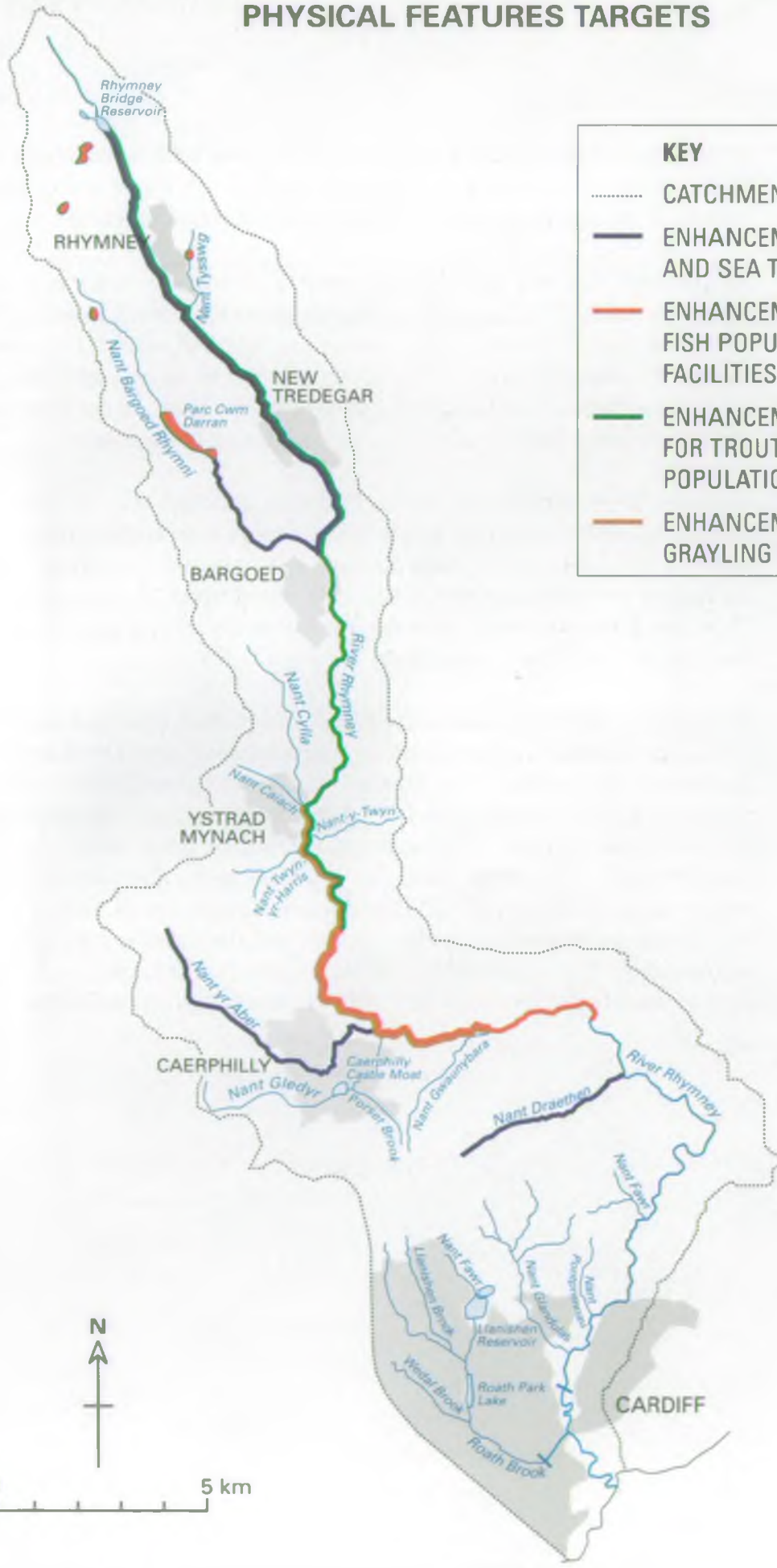
At present, it is not possible to make a detailed assessment of the environmental needs of the river nor implement its Regional Licensing Policy until it has been sufficiently tested. Until then, the NRA intends to protect the natural 95 percentile flows of the rivers (Q95). In an average year, river flows would be less than the Q95 for only 18 days. These target flows apply when considering new abstractions from surface or groundwater.

Groundwater abstractions are included because, although very limited in this catchment, abstraction from groundwater can reduce surface flows. The extent to which this occurs in the catchment is unknown at present, and it is difficult to put restrictions upon a licence based upon groundwater levels. Therefore, it is preferable to base the water quantity targets for groundwater upon the desired surface water flow.

As well as protecting ground and surface waters from over abstraction, the NRA intends to prevent the disruption of groundwater flows by the physical disturbance of aquifers. The flow of water underground is important in maintaining groundwater levels, which may support abstractions or environmental features. Construction, mining or other excavations can interrupt this flow, with potential impacts upon abstractions or the environment. The NRA can influence development proposals through its role as a planning consultee and, where appropriate, through the NRAs licences and consents. This target has been included in the NRAs "Policy and Practice for the Protection of Groundwater" (PPPG) detailed in Appendix 1a.

PHYSICAL FEATURES TARGETS

MAP 25.



KEY

- CATCHMENT BOUNDARY
- ENHANCEMENT OF SALMON AND SEA TROUT POPULATIONS
- ENHANCEMENT OF COARSE FISH POPULATIONS AND FACILITIES
- ENHANCEMENT OF HABITAT FOR TROUT AND SALMON POPULATIONS
- ENHANCEMENT OF GRAYLING POPULATIONS



5.3 PHYSICAL FEATURES TARGETS

General

Many Uses are affected by the physical characteristics or features of the river and this is especially true of Uses related to wildlife and its conservation. The habitat requirements of the wildlife associated with rivers are too complex to allow simple targets to be set, even if such habitats could be effectively measured. Consequently until such a time as quantitative physical targets can be set, Catchment Plans will adopt the general theme that the abundance and diversity of physical features typical of the type of river, should be maintained and where possible, improved. This requires subjective assessment by trained staff. To assist this assessment we are developing a habitat classification system and use related targets for physical features such as spawning and nursery sites for fish.

In a similar manner the physical features requirements of recreational Uses of waters cannot yet be quantified in order to set firm targets, again professional judgement must be used.

Flood Defence targets nearly all relate to physical features and the requirement for the river channel to contain retain specified flows at different points in its length.

Local Perspective

There are many Uses in the catchment which have their own physical features requirements. The following requirements are considered targets for the Rhymney catchment.

Fisheries

Through our operational, regulatory and advisory activities, and particularly in our role as a statutory consultee to the Local Planning Authorities, we will endeavour to ensure that there is:

- suitable habitat for fish breeding with an adequate distribution of potential redd sites and nursery areas.
- unimpeded access for migratory fish through the estuary and river to and from all potential spawning reaches (where appropriate), with adequate holding pools and cover throughout the catchment.
- effective fish screening on all abstractions and discharges (where necessary) to protect wild fish stocks and prevent escapement from fish farms.

Our intention to set specific targets relating to fish stocks and spawning success was recently announced in our published Fisheries Strategy. We will use the results of continuing fisheries monitoring surveys in the catchment to

CATCHMENT TARGETS

help in the determination of these targets, as well as data collected from rod and net catch returns. The following are identified for the Rhymney.

	Medium Term (5 years)	Long Term (10 years)
Target annual salmon run size	50	250
Target annual declared salmon rod catch	5	25
Target annual sea trout run size	100	500
Target annual declared sea trout rod catch	20	100
Target regular coarse fishing bag weight	20 lb	30 lb

Provision and maintenance of a diversity of natural river features to ensure variety of habitat to maximise production of fish populations. This target can be progressed by taking one or more of the following actions.

- Removing migration barriers where appropriate (Map 25).
- Implementing appropriate recommendations of our report - "Resident Brown Trout - A Management Strategy" (1992) to protect, enhance and monitor brown trout populations.
- Accelerating the restoration of salmon, sea trout and grayling populations by restocking where appropriate.
- Enhancing and developing the coarse fishing facilities and populations where appropriate.
- Enhancing the river habitat to increase carrying capacity for coarse fish, trout, salmon and sea trout, where appropriate.
- Introducing legislation (byelaws) to control over-exploitation of fish stocks.
- Implementing appropriate enforcement strategies to enact legislation designed to protect fish stocks from over-exploitation.
- Protecting fish habitats from development or enhancing them through the planning consultation process.

Flood Defence Where economically, technically and environmentally justifiable, the NRA will aim to maintain or improve in a cost effective manner, designated "Main Rivers" to standards of service (SoS) which accord with the following Land Use bands:

Land Use Band	Typical Description of Reach	Reference SoS - Flood Return Period (Years)	
		Fluvial	Tidal
A	Contains residential and non-residential properties distributed over a significant proportion of its length. Amenity uses may be prominent.	50-100	100-200
B	Reaches containing residential and non-residential property over some or all of the reach length but at lower density than Band A. Intensive agriculture may be present.	25-100	50-200
C	Isolated rural communities at risk with limited number of residential properties. Agricultural interests will be more apparent than in band A and B.	5-50	10-100
D	Isolated properties at risk. Agricultural use will probably be the main use with arable farming a feature.	1-10	2.5-20
E	Very few properties at risk. Agricultural use will be predominant with extensive grass land the main feature.	<2.5	<5
X	No recorded areas at risk of flooding.		

Note: The above standards of service table does not imply an entitlement to the provision of this or any standard but is indicative of the standards considered reasonable for the land use defined.

The NRA, in its role as statutory consultee under the planning legislation and by use of its consenting powers under the Water Resources Act (1991) and Land Drainage Act 1991 (as ammended by the 1994 Act), will:

- ensure provision of suitable access for maintenance of river/channel and sea/tidal flood defence and for the construction of new defences by the limitation of development within 7 m of the top of the river bank (use of byelaws and planning laws).
- ensure that obstructions to flow do not result in an increased flood risk (consent under WRA 1991 and LDA 1994).
- ensure development on the flood plain is identified and encourage planning authorities to use the planning process to guide development away from these areas (Section 105(2) survey and Welsh Office Circular 68/92).
- ensure that there is no increase in flood risk to existing properties as a result of further development either remote/or adjacent to existing

development (catchment planning to manage flows and/or loss of flood plain storage).

Where flood warning schemes are in place, the NRA will aim to provide a two hour warning of commencement of flooding.

Conservation

We will endeavour to set specific, objective targets for conservation in each catchment. To do so we will use the results of the national River Habitat (RHS) and River Corridor surveys.

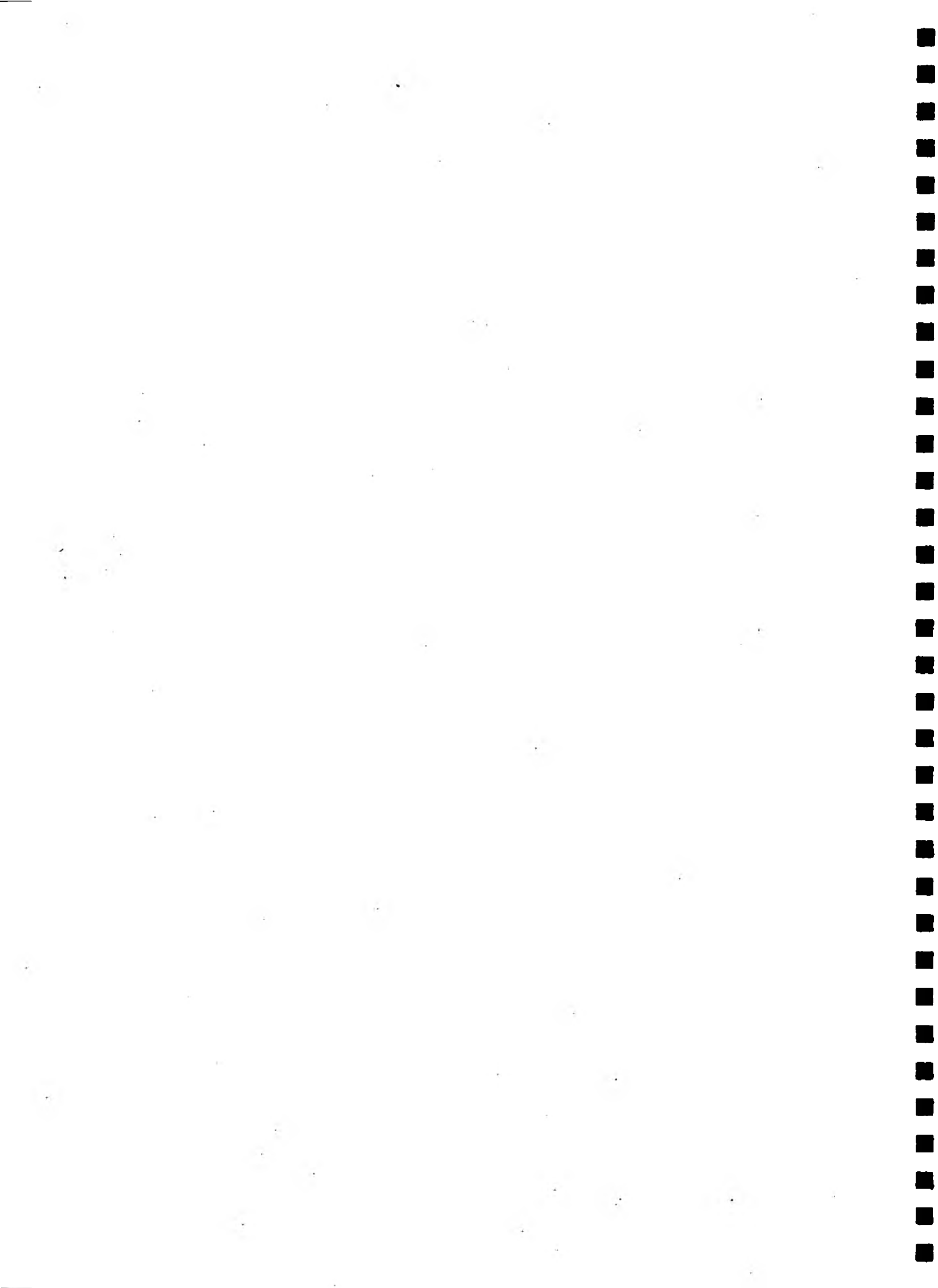
Through our operational, regulatory and advisory activities and particularly in our role as a statutory consultee to the Local Planning Authorities we will endeavour to ensure that:-

- biodiversity is maintained by:
 - retention of the current diversity of natural features such as riverbanks, wetlands, emergent vegetation, meanders, pools and riffles. We will encourage the fencing of water fringe zones and clearly defined livestock watering points to protect the riparian corridors from damage.
 - standards of service will be agreed with CCW to maintain and if possible enhance the conservation value of SSSIs that could be affected by our activities. Priority will be given to NNRs and SACs, together with the adoption of water level management plans.
- degraded habitats are restored by:
 - identification of areas of degraded wetland and riverine habitat and, where possible, rehabilitation to a level where they can support a range of species which is typical of similar habitats in other parts of the catchment.
 - an agreed programme of control, in conjunction with others, where Japanese Knotweed or other alien weeds cause operational or other problems.
- riparian and wetland landscape characteristics are conserved.
- the physical structure and setting of historic and archaeological sites, associated with water, is maintained and if possible enhanced. We will recognise the interdependence of many sites and monuments and where unavoidable change occurs will ensure that the detail of the site is carefully recorded.

**Recreation, Boating
& Navigation**

Through our operational, regulatory and advisory activities, and particularly in our role as a statutory consultee to the Local Planning Authorities, we will endeavour to ensure that:

- an appropriate network of riverside paths and access points is maintained and, where appropriate, promoted.
- protection is given to existing recreational sites, and that the development of new sites is promoted at suitable locations, as opportunities arise.
- consideration is given to the design of paths, access points and recreational developments, taking into account, wherever possible, the needs of the infirm and disabled.
- promotion of controlled users and use by contact recreational users (principally canoeists), with provision for both canoe touring and white water canoeing, where appropriate. This target can be progressed by the following actions.
 - * Liaison with fishery and riparian owners and canoeing organisations to encourage production of informal access agreements.
 - * Liaison with canoeing and angling organisations to promote mutual understanding of, and respect for, each others rights and requirements in undertaking their pastimes.
 - * No obstruction to the passage of vessels within the Rhymney estuary.



APPENDICES

APPENDIX 1a**THE GROUNDWATER PROTECTION POLICY**

The preservation of groundwater quality and quantity is a major objective of the NRA. Limiting the risk from pollution and over abstraction must be dealt with in a structured methodical manner.

The NRA has therefore produced a "Policy and Practice for the Protection of Groundwater" which provides advice on the management and protection of groundwater on a sustainable basis. The Welsh Region is implementing this national framework policy for the protection of groundwater which will effectively manage groundwater protection in the Rhymney Catchment. This new policy deals with the concept of vulnerability and risk to groundwater from a range of human activities. It considers both source and resource protection, together with policy objectives of the NRA with respect to the threat to groundwater from abstraction, physical disturbance of groundwater flows, waste disposal, contaminated land, discharges to underground strata, disposal of sludges to land and diffuse pollution.

The implementation of the policy relies in part on the construction of a series of protection zone maps. Resource protection maps will be produced after consideration of vulnerability of groundwater based on the nature of the strata and type of soil and drift.

The Policy recognises three groundwater source protection zones:

Zone I (Inner Source Protection)

Immediately adjacent to the source area defined by a 50-day travel time from any point below the water table to the source (based on biological contaminant decay).

Zone II (Outer Source Protection)

Area defined by 400-day travel time (based on the delay and attenuation of slowly degrading pollutants).

Zone III (Source Catchment)

The complete catchment area of a groundwater source. The controls to be exerted on a given activity will be more stringent the more vulnerable the resource and the nearer the source.

APPENDIX 1b**THE REQUIREMENT FOR AN ABSTRACTION LICENCE**

	0 - 5 m³	5 - 20 m³	Above 20 m³
One off, any purpose	No restriction	Consent	Licence
	0 - 5 m³/d	5 - 20 m³/d	Above 20 m³/d
Domestic, to one household	No restriction in most cases		Licence
Agriculture (from surface water)	No restriction for land adjoining watercourse		Licence
Agriculture (from groundwater)	Licence	Licence	Licence
All other purposes	Licence	Licence	Licence

APPENDIX 2 CLASSIFICATION SCHEMES**THE NATIONAL BIOLOGICAL CLASSIFICATION SCHEME (PROPOSED)**

A National biological classification scheme is currently being prepared as part of the General Quality Assessment (GQA) scheme (DoE 1992)*. The diversity of the aquatic macroinvertebrate fauna can reflect water quality and is useful in detecting intermittent reductions in quality, and pollution caused by chemical parameters that are not monitored. These events may not be detected by routine water quality monitoring because of their infrequent occurrence and short duration.

The proposed classification scheme would allow rapid comparison between chemical and biological quality for a given river and therefore highlight areas where disparity between the two occurs for further investigation.

The Rhymney Catchment

Data from biological surveys carried out during 1994 were classified using a prototype classification system. This scheme, called BAPC (BMWP** averages which parallel the chemical grading system), classifies sites according to the ratio of observed and predicted BMWP scores derived from family level identification of invertebrates. A class (a-f) was calculated for each site where biological information existed. This was then compared with the chemical classification for the respective site using the Regional application of an earlier version of the chemical component of the GQA scheme. Descriptions of the biological and water quality classifications used are provided overleaf.

* DoE/WO 1992: River Quality, The Governments Proposals: A Consultation Document.

** BMWP - Biological Monitoring Working Party.

GENERAL QUALITY ASSESSMENT SCHEME FOR RIVERS

Class	Chemical Classification		
	DO % sat 10%ile	BOD mg/l 90%ile	Ammonia mg N/l 90%ile
A	80	2.5	0.25
B	70	4.0	0.6
C	60	6.0	1.3
D	50	8.0	2.5
E	20	15.0	9.0
F	<20	-	-

Note: The NRA are currently developing nutrient, biological and aesthetic components of the GQA scheme which will compliment the established river chemistry component.

RIVER ECOSYSTEM CLASSIFICATION: WATER QUALITY CRITERA

The *Surface Waters (River Ecosystem) (Classification) Regulations 1994* 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 hierarchical classes in order of decreasing quality.

Class	Dissolved Oxygen	BOD (ATU)	Total Ammonia	Unionised Ammonia	pH	Hardness	Dissolved Copper	Total Zinc
	% saturation 10 %ile	mg/l 90 %ile	mg N/l 90 %ile	mg N/l 95 %ile	lower limit as 5%ile; upper limit as 95%ile	mg/l Ca CO ₃	µg/l 95%ile	µg/l 95%ile
RE1	80	2.5	0.25	0.021	6.0-9.0	≤ 10 >10 & ≤ 50 >50 & ≤ 100 >100	5 22 40 112	30 200 300 500
RE2	70	4.0	0.6	0.021	6.0-9.0	≤ 10 >10 & ≤ 50 >50 & ≤ 100 >100	5 22 40 112	30 200 300 500
RE3	60	6.0	1.3	0.021	6.0-9.0	≤ 10 >10 & ≤ 50 >50 & ≤ 100 >100	5 22 40 112	300 700 1000 2000
RE4	50	8.0	2.5	-	6.0-9.0	≤ 10 >10 & ≤ 50 >50 & ≤ 100 >100	5 22 40 112	300 700 1000 2000
RE5	20	15.0	9.0	-	-	-	-	-

APPENDIX 3 GLOSSARY OF TERMS, UNITS AND ABBREVIATIONS**ABSTRACTION**

When someone takes water, either permanently or temporarily, from a source (river, stream, spring, pond, lake or groundwater) they are 'abstracting' the water and they are making an 'abstraction'.

ABSTRACTION LICENCE

Authorisation granted by the NRA to allow the abstraction of water from a source of supply.

ACUTE

Used to describe a sudden dramatic effect, eg a major pollution or overnight change in river course. Often used in conjunction with 'chronic' which describes longer term lower level impacts.

ADIT

An almost horizontal shaft into a mine, for access or drainage.

AFFORESTATION

The process of creating a forest where none existed before.

ALGAE

Simple plants which may be floating or attached. They can be microscopic or very large plants but they lack true stems. Like all plants, they are capable of photosynthesis. Algae occur in still and flowing water and are often discussed in the context of Eutrophication (see below).

ALLUVIAL DEPOSITS

Layers of sediment resulting from the activity of rivers. Usually fine material eroded, carried, and eventually deposited by rivers in flatter areas such as flood plains or lake beds.

AMELIORATE

To cause something to get better.

AMMONIA

A chemical which is often found in water as the result of the discharge of sewage effluents. It is one of the chemicals measured to characterise water quality. High levels of ammonia adversely affect the quality and use of water for fisheries and abstractions for potable water supply.

AOD (ABOVE ORDNANCE DATUM)

Land levels are measured relative to the average sea level at Newlyn in Cornwall. This average level is referred to as 'Ordnance Datum'. Contours on Ordnance Survey maps of the UK show heights above Ordnance Datum.

AQUATIC ENVIRONMENT

The rivers, streams, lakes, ponds, springs and features that depend on natural waters such as bogs, wetlands etc.

AQUIFER (MINOR AQUIFER)

A sub-surface zone or formation of rock which contains exploitable resources of groundwater. Minor aquifers seldom produce large quantities of water but are important for local water supplies and in supplying base flow for rivers.

BASE - FLOW

That part of the river flow that is derived from groundwater sources rather than surface run-off.

BIOACCUMULATION

The accumulation, by living organisms, of materials to concentrations higher than those of the surrounding environment. This is particularly important where poisons are accumulated.

BOD

An abbreviation for Biochemical Oxygen Demand. This is an estimate of the rate at which biological and chemical processes use up the oxygen available in water. It is one of the features that are used to classify water quality

BUFFER ZONE

A strip of land, usually 10-100m wide, at the side of a river which is isolated from the general surrounding land-use and allowed to develop naturally. This provides a number of benefits as well as providing valuable wildlife habitat. These include reduced inputs of silt and some pollutants and protection of river banks from erosion by livestock while allowing the river to respond naturally without undue threat to life or property.

CATCHMENT

The area of land draining to a defined point.

CHRONIC

Used to describe an effect, usually pollution or physical damage, that has gone on for a long time or takes a long time before an impact is seen. Often used in contrast to 'acute' which describes sudden dramatic effects.

CLASSIFICATION/CLASSES

A way of placing waters in categories (classes) according to assessments of water quality based, for example, on measurements of the amount of particular chemicals in the water (especially BOD, dissolved oxygen and ammonia).

COARSE FISH

Freshwater fish other than salmon and trout, many belonging to the carp family (Cyprinids).

CONFLUENCE

The point where two or more streams or rivers meet.

CONSENT

Two types of consent are issued by the NRA:

Discharge Consents are statutory documents to indicate any limits and conditions on the discharge of an effluent to a controlled water.

Land Drainage Consents authorise works to the beds and banks of a river.

CONTROLLED WATERS

All rivers, lakes, groundwaters, estuaries and coastal waters to three nautical miles from the shore.

CULVERT

Artificial channel, pipe or conduit that carries water under a road, canal etc.

CUMECS

Short for cubic metres per second (m^3/s). There are 86,400 seconds in a day. This is used to measure river flows.

DANGEROUS SUBSTANCES

Substances defined by the European Commission as in need of special control. This is because they are toxic, accumulate and concentrate in plants and animals, or do not easily break down into less dangerous substances. They are classified as List I or List II.

DEROGATION (Water Quality)

Derogation (ie. waiving the result) may be applied where water quality fails a target due to natural or man-made conditions that are not readily controllable (eg. low pH and/or elevated metal concentrations). This approach prevents unnecessary downgrading of waters and also carries the benefit that other, more controllable, aspects of water quality can be protected by the NRA at the target level.

DEROGATION (Water quantity).

A legal term that describes a diminution of the water rights of existing water users due to a new abstraction.

DIFFUSE

Spread out, not associated with a single place or point.

DISSOLVED OXYGEN

The amount of oxygen dissolved in water. Oxygen is vital for life, so this measurement is an important, but highly variable, test of the 'health' of a water. It is one of the features that are used to classify water quality.

ECOSYSTEMS

A group of animals and plants which live together within a certain type of surrounding or habitat (e.g. woodland, pond).

EC DIRECTIVE (Control)

A type of legislation issued by the European Community which is binding on Member States and sets standards and results to be achieved.

ENVIRONMENTALLY SENSITIVE AREA (ESA)

An area where the landscape, wildlife and historic interest are of national importance. Payments are made by Welsh Office to ensure appropriate sensitive land use.

EUTROPHIC/EUTROPHICATION

Terms which describe water which is rich in nutrients or the process of enrichment. At worst, such waters are sometimes beset with unsightly growths of algae which may pose a health risk to humans and livestock.

FAUNA

Animal life.

FLORA

Plant life.

FLUVIAL

Associated with river processes such as flow and erosion.

FYKE NETS

A special type of net designed for catching eels.

FRESHET

A naturally or artificially generated increase in river flow after a period of dry weather, having the effect of enhancing water quality and the aquatic environment eg. through improved levels of dissolved oxygen and flushing of accumulated debris and silt.

FRY

Fish which are less than 1 year old.

GAUGING STATION

A site where the flow of a river is measured. Sometimes a weir is used to assist the measurement.

GROUNDWATER

Water contained within pores, cracks and fissures in rocks.

HABITAT

The natural home of plants and animals. Different plants and animals have different needs, and so live in different habitats.

HEAD

A measure of the height between upstream water level and power generating equipment.

HEADRACE

A channel that carries water to a water wheel or turbine.

INDICATIVE FORESTRY STRATEGY

These are produced by some local authorities and show the areas of land that are suitable or unsuitable for afforestation. They are divided into 'preferred areas', 'potential areas' and 'sensitive areas'.

LEACHATE

This is the product of the removal of soluble substances by action of water percolating through soil, waste or rock. Often used in association with dumped waste materials.

LEAT

A channel which conveys water to a mill wheel.

LIST I AND LIST II SUBSTANCES

European Community Directive 76/464/EEC aims to reduce pollution in controlled waters by certain dangerous substances. These consist of chemicals selected mainly on the basis of their toxicity, persistence and bioaccumulation. These substances are divided into 2 categories:

- List I substances are considered to be the most harmful. Pollution caused by these must be eliminated.
- List II substances are less harmful and pollution caused by these must be reduced.

m³/d

Short for cubic metres per day. There are 1000 litres in a cubic metre, and 1000 cubic metres in a megalitre (Ml). In Imperial Units, there are 220 gallons in a cubic metre. This unit is often used to measure abstraction of water.

m³/s

Short for cubic metres per second (cumecs). There are 86,400 seconds in a day. This is used to measure river flows.

MACROINVERTEBRATE FAUNA

Small aquatic animals, such as insects, snails and worms which live in or on the river bed.

mm

Short for millimetres. There are 1000mm in a metre. This unit is used to measure rainfall.

STATUTORY MAIN RIVER

A legal definition which defines particular rivers and streams on special maps. On the 'Main River', the NRA has permissive powers to construct and maintain defences and to control the actions of others through Byelaws and the issue of Consents. Any proposal that could interfere with the bed or banks or affect the flow of the river requires formal consent from the NRA.

Ml/d

Short for megalitres per day, a standard international unit of measurement. There are a thousand cubic metres in a megalitre and one million litres in a megalitre. In Imperial Units, one megalitre is about 220,000 gallons. This unit is often used to measure abstraction of water.

NITRATE SENSITIVE AREAS (NSA) AND NITRATE VULNERABLE ZONES (NVZ)

Land in areas where water sources exceed or will exceed 50mg/l of nitrate by 2010 are designated as NVZs. Farmers are required to follow regulations designed to reduce nitrate loss from their land in both NVZs and NSAs although they only receive compensation for doing so in NSAs.

PARAMETER

A general name for a characteristic or aspect of water quality. It is often a feature which can be described numerically.

PARCOM

A monitoring programme for pollutants selected by the **Paris Commission**, carried out by the NRA in England and Wales.

PARR

Salmon which are 1 or more years old which have not yet gone to sea.

PERMEABILITY

The ease with which liquids (or gases) pass through materials, (often rocks or soils).

PERMISSIVE POWER

The NRA is given various powers to do things by a number of Acts of Parliament. Some of these powers are 'permissive', which means the NRA can do these things, but is not under a duty to do them. For example, NRA has permissive powers to construct flood defences, but does not have a duty to do this. In contrast, the NRA has certain statutory duties, i.e. things it must do, e.g. it must authorise abstractions, discharges and works to the bed or banks or main rivers.

POOL

A distinct, deeper area of slow flowing water, often with an eddying flow and often found between fast flowing stretches which are known as 'riffles'.

POROSITY

The volume of water that can be held within rock or soil. This is determined by the total volume of the rock or soil divided by the spaces (voids) within it.

POTABLE

Water suitable for drinking.

PUT AND TAKE

Fisheries, usually trout lakes, where fish are stocked on a regular basis to replace those caught and removed.

REACH

A length of a river.

RED LIST SUBSTANCE

A substance that has been selected for monitoring due to its toxicity, persistence and bioaccumulation.

REDD

Salmon excavate a depression in river gravels into which they lay their eggs. The eggs are then covered with gravel. This 'nest' is known as a 'redd'.

RIFFLE

Fast flowing shallow water with a distinctly broken or disturbed surface. Riffles are often found between pools.

RIPARIAN

Associated with the river bank. A Riparian owner is the owner of the banks and land adjacent to the river and usually owns the river bed to the mid - point of the wetted channel.

RIVER CORRIDOR

A term which describes a stretch of river, its banks, and a varying amount of adjacent land that is affected by the presence of the river.

RIVERINE

Something that is associated with the river environment.

RIVER QUALITY OBJECTIVE (RQO)

The quality of water that the river should attain in order to support its agreed uses. An RQO may be bound to a certain date for achievement or to a future, indefinite, time. The latter is described as a Long Term RQO (LTRQO).

SALMONID FISH

Game fish, e.g. trout and salmon.

SETASIDE

The Common Agricultural Policy reform provides for land to be removed (set aside) from food production to reduce surpluses. The land can be set aside temporarily or permanently and can be a valuable opportunity for wildlife habitat improvement or the provision of riparian buffer zones.

SMOLT

At a particular stage of their development, young salmon and sea trout migrate to the sea, and at this stage are known as smolts.

SPATE (flash flood)

A sudden increase in river flows that may cause flooding or other damage. Typically the flows will fall as quickly as they rose once rainfall ceases. A spate, or flashy river is one that is characterised by such sudden and wide variations in flow as a result of rainfall.

SPRING RUN

Salmon return from the sea to freshwater rivers when adults. They migrate up the rivers to spawn, and this upstream migration is known as the 'run'. There are two main periods of the year when the runs occur; spring and autumn. The spring run fish are often larger than later-run fish, and are often more prized by anglers.

SSSI

Abbreviation for 'Site of Special Scientific Interest'.

SURFACE WATERS

This is a general term used to describe all the water features such as rivers, streams, springs, ponds and lakes.

TELEMETRY

Telemetry is a means of collecting information that has been logged by unmanned monitoring stations (often for river flows or rainfall) using a computer that is connected via the public telephone system.

TIME LIMITED LICENCE

Every licence states whether it is to remain in force until revoked or is to expire on a specified date.

UNCLASSIFIED REACHES

Stretches of river (usually smaller streams) that do not fall under the General Quality Assessment classification scheme and therefore do not have their water quality monitored routinely.

WASHLANDS

Extensive areas of semi-natural flood plain next to a river, where water is stored during floods. The amount of water stored may be altered by man made devices such as weirs and sluices. Washland storage has the effect of reducing the flood peak downstream and may help to protect developed areas from flooding and also provide valuable wildlife habitats.

WEIR

A low dam built across a river to raise the water level, divert the water or control its flow.

WETLAND

Wet areas where the animals and plants that live there are dependent on that 'wetness' for their survival. They include bogs, reed-swamps and mires but not the river corridor.

95-PERCENTILE FLOW (Q95)

The flow which one would expect to be exceeded 95% of the time on average. This is an estimate of the dry weather flow which the river would be at, or below, for 18 days per year on average.

APPENDIX 4 NRA RESEARCH PROJECTS RELEVANT TO RHYMNEY CMP

- R&D Project 5 - "Environmental impact of fish farming".
- R&D Project 10- produced 3 Project Board Reports entitled " Environmental Quality Standards to protect identified uses of controlled waters". Vol.1 looked at general and special ecosystems, Vol. 2 looked at fisheries and Vol. 3 dealt with other uses.
- R&D Project 238 - produced Project Record 238/2/T "Sensitivity of sea defence structures to rise in sea level".
- R&D Project 294- produced R&D Note 233 " Control of invasive riparian and aquatic weeds".
- R&D Project 339 - produced R&D Note 243 "Treatment processes for ferruginous discharges from disused coal workings".
- R&D Project 360- produced R&D Notes 102 and 103 "Constructed wetlands to ameliorate metal-rich minewater: review of literature: study of natural wetlands".
- R&D Proj.415&321- produced R&D Note 174 "Sources, pathways and sinks of litter in riverine and marine environments".
- R&D Project 422- "Review of water quality implications of conifer harvesting" produced R&D Notes 156 and 159.
- R&D Project 465- "Impact of fine particulate outputs associated with timber harvesting". Report due in 1996.
- R&D Project 473- produced " Control of pollution from highway drainage discharges for new road systems". Available as a CIRIA report No. 142.
- R&D Project 537- "Use of industrial by-products in road pavement foundations". Report due 1995.

The reports which have been completed can be purchased from: Foundation for Water Research, Allen House, The Listons, Liston Road, Marlow, Bucks. SL7 1FD. Tel: 01628-891589.