NRA-Wales 43

AFAN & KENFIG
CATCHMENT MANAGEMENT PLAN
CONSULTATION REPORT

NRA

National Rivers Authority
Welsh Region

AFAN AND KENFIG CATCHMENT MANAGEMENT PLAN

CONSULTATION REPORT

July 1995

National Rivers Authority
Welsh Region

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Cover Photograph: Eglwys Nunydd Reservoir (NRA)

THE AREA MANAGER'S VISION FOR THE AFAN AND KENFIG CATCHMENTS

The Afan and Kenfig catchments show markedly different characteristics from one another. The upper parts of the Afan are significantly afforested, giving way to concentrated urban areas and heavy industry, most noticeably British Steel, on the coast. The Kenfig, by contrast, is largely rural, with comparatively little industry; seven Sites of Special Scientific Interest (SSSIs) and a National Nature Reserve (NNR), Kenfig Pool and Dunes, demonstrate its conservation value. Both catchments bear evidence of past mining activity, in the form of iron rich acidic discharges present in many rivers.

During the life of this Plan, we would wish to see significant progress in:

- **improving water quality** - the most damaging discharges of acidic, iron-rich minewaters from historical mining activities in the catchment will be addressed by a major EC and WDA funded collaborative project to provide treatment solutions and restore water quality to the River Pelenna. The technology developed by this demonstration scheme should assist with developing solutions for similar problems locally, and throughout the South Wales coalfield and further afield. Further understanding of the acidification problems in the catchment will help develop responses to future emission and land use proposals which could impact on the catchment.

- **developing the migratory fishery** - in order to continue the rapid improvements in salmon and sea trout populations in the Afan, the availability of suitable spawning gravels needs to be increased by constructing fish passage facilities at some man-made obstructions.

- **protecting river corridors and floodplains** - the concept of "buffer zones" alongside watercourses needs to be developed, in rural and urban areas, to encourage the formation of natural river corridor habitats where waterside flora and fauna can thrive. Wherever possible, new development should be directed away from floodplains, unless appropriate flood defence works are in place or alleviation works form part of the proposal.

- **maintaining flood protection for urban areas** - significant development has taken place in the flood plain in the past and this development is at risk from flooding. Flood defences have been constructed at various sites to improve flood protection standards and a programme of river maintenance works, which includes removal of gravel shoals, is undertaken by the NRA in order to maintain these defences and to maximise the flow carrying capacity of the channel. Further investigations are necessary to determine the feasibility of improving existing defences and to increase the effectiveness and efficiency of the maintenance operations.

- **balancing abstraction with the needs of the environment** - industry has long-standing rights to abstract water from various locations within the catchment, at rates which may adversely affect fisheries and the wider water environment. Abstraction uses must be balanced against the environmental needs of the river system, and we propose to implement an objective methodology for assessing the state of the catchment in water quantity terms.

Realisation of the NRA's vision will be achieved through a balanced management approach to all activities. We will encourage imaginative proposals to allow sustainable economic and community development to proceed whilst ensuring protection and improvement of the water environment. We will collaborate actively with all users of the catchment and all those statutory bodies that can assist us in striving to achieve this vision.

DAVID WALKER
AREA MANAGER - SOUTH WEST WALES

David Walker

CONTENTS

			Page
Frontispiece:	The Area Manager's Vision for the Afan and Kenfig Catchments		i
PART I	**THE AFAN AND KENFIG CATCHMENT MANAGEMENT PLAN CONSULTATION REPORT**		
1.0	**THE PURPOSE OF CATCHMENT MANAGEMENT PLANS (CMPs)**		**2**
1.1	The Role of the NRA		3
1.2	What this Plan is Designed to do		4
2.0	**AN OVERVIEW OF THE AFAN AND KENFIG CATCHMENTS**		**5**
2.1	Introduction		6
2.2	Infrastructure		6
2.3	Land Use		6
2.4	Flood Defence		7
2.5	Hydrology and Hydrogeology		7
2.6	Fisheries		8
2.7	Conservation		8
2.8	Recreation		8
2.9	Water Quality		9
2.10	Monitoring	- River Levels, Flows and Rainfall	10
		- Water Quality	10
		- Biology	10
		- Habitat Surveys	10
		- Fish Stocks	11
2.11	Key Details		12
3.0	**ISSUES AND OPTIONS**		**14**
3.1	THE STATE OF THE CATCHMENT		15
	3.1.1 Water Quality		16
	3.1.2 Water Quantity		19
	3.1.3 Physical Features		22
	3.1.4 Conflicts Between Uses		25
3.2	A SUMMARY OF THE ISSUES AND OPTIONS FOR THEIR RESOLUTION		26

PART II SUPPORTING INFORMATION

		Page
4.0	**THE USES OF THE AFAN AND KENFIG CATCHMENTS**	**47**
4.1	Urban Development	48
4.2	Flood Defence	50
4.3	Solid Waste Disposal (Landfill)	54
4.4	Fisheries	56
4.5	River Ecosystem	60
4.6	General Ecosystem	62
4.7	Special Ecosystems	64
4.8	Conservation of Nature, Landscape and Heritage	66
4.9	Abstraction	68
4.10	Sewage Effluent Disposal	71
4.11	Industrial Effluent Disposal	74
4.12	Basic Amenity	76
4.13	Angling	77
4.14	Water Sports Activity	79
4.15	Navigation and Boating	81
4.16	Agricultural Activity	83
4.17	Forestry	86
4.18	Mineral Extraction	88
5.0	**CATCHMENT TARGETS**	**91**
5.1	Water Quality Targets	92
5.2	Water Quantity Targets	94
5.3	Physical Features Targets	96
APPENDIX 1	THE GROUNDWATER PROTECTION POLICY	102
APPENDIX 2	THE NATIONAL BIOLOGICAL CLASSIFICATION SCHEME (PROPOSED)	104
APPENDIX 3	GLOSSARY	106

MAP CONTENTS

Map No.	Title	Opposite Page
1	Main Towns and Rivers	6
2	State of the Catchment - River Ecosystem (RE)	16
3	State of the Catchment - General Water Quality	17
4	State of the Catchment - Water Quantity	20
5	State of the Catchment - Physical Features	22
6	Conflicts Between Uses	25
7	Infrastructure and Population	48
8	Flood Defence	51
9	Solid Waste Disposal	54
10	Fisheries	57
11	Current Quality as Defined by River Ecosystem (RE) Standards	60
12	River Corridor Conservation	62
13	Special Ecosystems, Conservation and Historic Monuments	64
14	Licensed Abstractions	69
15	Sewage Effluent Disposal	72
16	Industrial Effluent Disposal	74
17	Basic Amenity	76
18	Angling	77
19	Water Sports Activity	79
20	Navigation and Boating	81
21	Agriculture and Forestry	84
22	Mineral Extraction	89
23	Water Quality Targets - River Ecosystem (RE)	92
24	Water Quality Targets - General	93
25	Water Quantity Targets	94
26	Flood Defence Targets	97

PART I

THE AFAN AND KENFIG 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

Never before have the rivers, lakes, estuaries and coastal waters of Wales been subject to such large and rapidly increasing demands from the users of water. Many different uses interact, or compete for water or water space, and will inevitably come into conflict with one another. The National Rivers Authority (NRA) is the major manager of the water environment in England and Wales and has the responsibility to reconcile conflicts between water users as well as its general duties that include: -

- Maintenance and improvement of water quality by control of pollution in surface and groundwater.
- Flood defence for people and property.
- Flood warning.
- The proper management of water resources by conservation, augmentation and control.
- Maintenance and improvement of fisheries.
- Conservation of the natural water environment.
- Promotion of water based recreation.
- Navigation (in some rivers).

The NRA also plays 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 Afan and Kenfig catchments, and is based on a detailed study carried out by the NRA during 1994. 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 WQO 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. 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 Afan and Kenfig Catchments.

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

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2.0 AN OVERVIEW OF THE AFAN AND KENFIG CATCHMENTS

2.0 AN OVERVIEW OF THE AFAN AND KENFIG CATCHMENTS

2.1 Introduction

For the purposes of this Catchment Management Plan, the "catchment" refers to the catchment area of the rivers Afan and Kenfig, two distinct hydrological catchments, unless specifically stated otherwise. The Ffrwd Wyllt, once a tributary of the Afan until the creation of Port Talbot docks; now discharges to the mouth of the Afan Estuary via the docks.

The Afan flows in a southwesterly direction from the Rhigos Mountains (highest point 568m) to Port Talbot, whilst the Kenfig flows south to Kenfig Hill before turning westward to pass north of Pyle, through an area of sand dunes to the sea. The highest elevation in the Kenfig catchment is 319m.

The catchment area includes a narrow lowland coastal strip, which is widest to the south, behind which lie steep sided, extensively afforested valleys.

The former mining communities, such as Cymer, Abergwynfi, Glyncorrwg and Tonmawr now remain as dormitory villages with little industry.

2.2 Infrastructure

The M4 motorway, a Euroroute linking London with Fishguard, traverses the catchment behind the coastal strip. The major road artery serving the Afan catchment is the A4107, hugging the river for much of its length. Several 'A' and 'B' class roads criss-cross the Kenfig catchment. The main railway link is the Intercity line between London and Swansea, which continues westward to Fishguard and links with the ferry route to the Irish Republic.

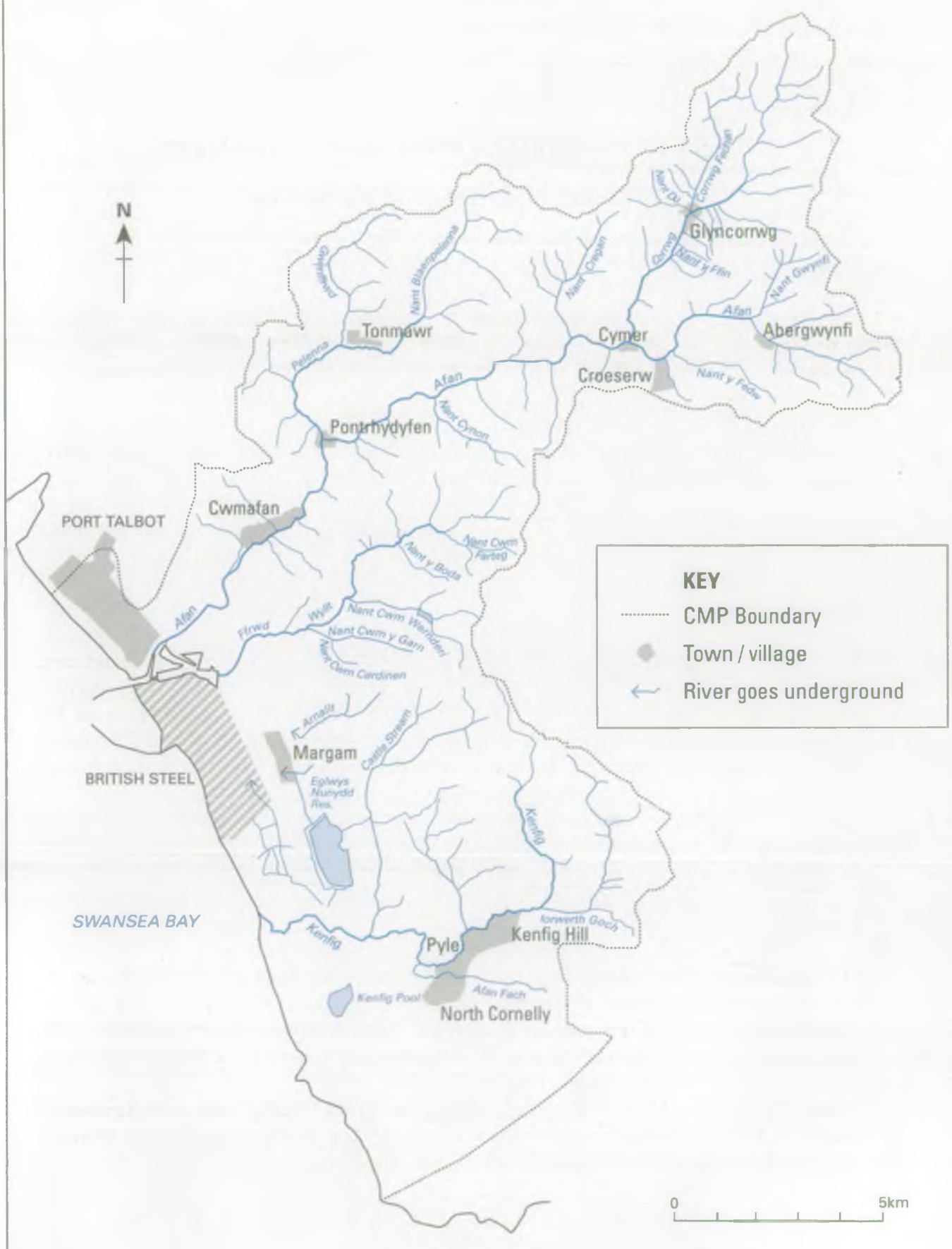
The once thriving Port Talbot docks have now been sealed and boats are unable to pass to and from the sea. Large vessels berth adjacent to the mouth of the Afan at the British Steel complex with cargos of coal, ore and oil.

2.3 Land Use

The catchment, particularly the Afan catchment, contains major developed areas along the lowland coastal strip, especially around Port Talbot. Industry is heavy in this area, most noticeable is the British Steel complex at Margam. Small towns are located throughout the Afan Valley and in the middle reaches of the Kenfig, and as such are at risk from flooding

The majority of the Afan catchment is used for coniferous forestry, with some farming of sheep and cattle on the high ground in the headwaters. The Kenfig supports more intensive agriculture on generally better quality land around Margam.

MAP 1. MAIN TOWNS AND RIVERS



FOLD OUT TO SEE MAP 1: MAIN TOWNS AND RIVERS

To be read in conjunction with all other maps

Evidence of man's past activities in the mid and upper reaches of the catchment is provided by abandoned mine sites and associated discharges of acidified, iron rich water. Metal smelting used to occur in the Afan valley and areas of contaminated land in Cwmafan, around the estuary and at British Steel have been located, but there is no evidence of any significant pollution as a result.

2.4 Flood Defence

The catchment contains areas of flood plain upon which development has taken place and which is now at flood risk. Flood defence interest relates primarily to these areas and aims to provide and maintain standards of flood protection commensurate with their usage. Flood defence operations generally involve maintaining channel capacity by dredging and removing obstructions from the channel, managing bankside vegetation to prevent trees being dislodged under flood conditions and creating blockages, and maintaining flood defences. These operations will continue, although they are regularly reviewed to ensure a cost-effective service. Revenue expenditure for maintenance purposes within the catchment is on average £140k per annum.

Flood protection standards at Taibach and Cwmafan are considered to be below the indicative standard for residential land use. Studies will be undertaken at these sites to determine whether improvements can be made. If improvements are deemed feasible then the work will be undertaken and an appropriate maintenance programme implemented.

Flood warnings are issued by the NRA via the police for the Port Talbot area. These warnings, while providing advanced notice of flooding, do not comply with the NRA's target standards. Existing procedures will therefore be reviewed to determine whether improvements can be made.

2.5 Hydrology and Hydrogeology

Annual rainfall in the catchment ranges from approximately 1440 mm near the coast to 2140 mm in the upland catchment area. The average rainfall of 1790 mm is relatively high compared with the Welsh Region average of 1310 mm and the England and Wales average of 909 mm.

The catchment are located on the southern edge of the South Wales coalfield syncline and the predominant rock types are Middle and Upper Coal Measures and Carboniferous Limestone. Although these can yield substantial quantities of water, the disturbance resulting from mining can lead to local variations in reliability. The groundwater held in glacial deposits overlying the solid geology is used as source of supply.

The main demand placed on water resources within the catchment is for use by industry. Review of the impact of this use is identified as an issue later in this report.

2.6 Fisheries

The quality of salmon and sea trout fisheries in the Afan has dramatically improved in recent years, since the virtual elimination of the fishery in the early 19th century, with anglers catching increasing numbers of both species each year. Improvements have been brought about by a number of factors, including the alleviation of several obstructions to fish, a restocking programme by the predecessors of the NRA, and improvements to water quality throughout much of the catchment.

The Ffrwd Wyllt is predominantly a brown trout fishery although small numbers of sea trout are known to ascend the river from the docks in order to spawn. The much smaller Kenfig supports a predominantly brown trout fishery with some sea trout entering the river when flows permit in the summer months. In many tributaries of the Afan, Ffrwd Wyllt and Kenfig, obstructions to the passage of migratory fish, together with minewater problems and acidification, are likely to result in stocks being sub-optimal.

The fisheries of the Afan, Ffrwd Wyllt and the Kenfig are controlled by local angling organisations which have taken an active role in assisting with improvements to the fishery.

2.7 Conservation

Within the catchment, there are seven sites of Sites of Special Scientific Interest, including Kenfig Pool (also a National Nature Reserve) and Eglwys Nunydd Reservoir. Kenfig is an important site for several species including the Fen Orchid. All of these designated sites are located in the Kenfig catchment.

Whilst there are no formal records of otters in recent times, they are present in neighbouring catchments and it is believed that it is only a matter of time before they migrate into the catchment, which should have the capacity to sustain them given the predominantly rural nature and improving water quality.

Invasive plants, such as Japanese Knotweed and Himalayan Balsam, are present throughout the middle and lower reaches of the Afan and the Kenfig, reducing bankside diversity and restricting native plants in localised areas.

2.8 Recreation

Large numbers of visitors are attracted to an area of scenic beauty which is attractive for many leisure activities including rambling, birdwatching and pony-trekking. An extensive footpath network is supplemented by a high quality cyclepath along the length of the Afan Valley, with access from Glyncorrwg to Port Talbot. Country parks at Margam and Afan Argoed are popular for many types of recreation.

A number of stillwater trout fisheries exist, including those in Margam Park and the largest at Eglwys Nunydd reservoir, which is controlled by a section of the sports club at British Steel. Angling on the Afan and Ffrwd Wyllt is controlled by the Afan Valley Angling Association and membership is restricted to members of the local community. Angling on the Kenfig is controlled by Kenfig Hill and District Angling Association which also leases the fishing rights for Kenfig Pool.

Water sports are concentrated mainly in the Porthcawl area and at Aberavon Sands, with surfing and jet-skiing taking place. Two EC Identified Bathing Waters, at Aberavon Slip and Rest Bay, are frequented by swimmers, especially in the summer months. Currently, no canoeing is allowed above the tidal limit in the freshwater reaches by the controlling fishing interests. A large sailing club operates at Eglwys Nunydd and pleasure boats of all types are used in coastal waters.

2.9 Water Quality

Water quality in the main freshwater watercourses is generally high, 94% of classified reaches were within Classes A and B in the 1993 River Quality Survey. Approximately 16km of the Afan is designated as an EC Freshwater Fishery. Population and industry are concentrated along the coast, and the dilution available at sea is sufficient for the discharges from these sources not to have a significant impact.

Sewage from almost the whole catchment is now disposed of via the Afan long sea outfall, and water quality in the rivers is no longer affected by continuous discharges of sewage effluent. There are intermittent problems in parts of the catchment, caused by discharges from inadequate sewerage systems and Combined Sewer Overflows (CSOs). Pollution has also been caused in a few instances by releases of farm effluent.

There are no significant industrial discharges to freshwater. The once thriving collieries within the catchment have now closed, leaving numerous discharges from the abandoned workings which result in pollution of receiving waters. Typically, these streams are stained with orange deposits of ochre (iron). Many parts of the Afan catchment are also affected by surface water acidification, caused by acidic deposition from the atmosphere and influenced by land management practices.

The NRA is collaborating with West Glamorgan County Council in a major scheme in the Pelenna sub-catchment, funded by the EC LIFE programme and the Welsh Development Agency, with additional financial support from the BOC Foundation for the Environment. A treatment system based on constructed wetlands is to be used to treat five discharges from abandoned mines. The scheme is intended to benefit the Pelenna but also to act as a demonstration project for the whole of Europe.

2.10 Monitoring

River Levels, Flows and Rainfall

Within the catchment there is one primary river gauging station, in the Afan catchment, at Marcroft Weir, which is located just upstream of Port Talbot. There is also a river level station at Cwmafan and three raingauges provide daily rainfall information. The data collected are used by the NRA to manage water resources, which includes the control and regulation of abstraction. Other rainfall and river flow monitoring is being undertaken to support mine discharge investigations.

The gauging and river level stations are connected to telemetry to provide information immediately to NRA staff at times of flood risk. There is an NRA groundwater monitoring borehole located in Cornelly. This was drilled in 1994.

Water Quality

Water quality monitoring takes place regularly at 24 sites, samples being analysed for many different chemical parameters. This monitoring is undertaken to assess general water quality and compliance with the requirements of certain EC Directives, as well as to support special investigations and pollution incident investigations. All significant discharges are sampled and analysed routinely to ensure they meet standards required by the NRA.

Historically, groundwater quality has not been routinely monitored.

Regular inspections are carried out at sites which present a high risk of pollution, including farms, trade premises, industrial sites and sewage installations as part of the NRA's pollution prevention programme.

Biology

Routine biological monitoring is undertaken at 14 sites within the catchment. An assessment of the biological quality is made by analysing the species of insect larvae and other small aquatic animals that are present. Other surveys are carried out to assess impacts of discharges, such as CSOs, within the catchment.

Habitat Surveys

A River Corridor Survey was completed for the catchment in 1994, which recorded the nature and extent of different habitats found along the river corridor. This survey forms part of a strategic national programme.

Fish Stocks

Assessment of fish stocks is undertaken as part of the Regional Juvenile Salmonid Monitoring Programme, which estimates juvenile abundance based using electro-fishing techniques. The most recent surveys were undertaken on the Afan in 1992, and the Kenfig in 1994. Data were collected from 26 separate sites in the catchment.

Trends in adult stocks are monitored using catch returns received from salmon and sea trout anglers. These figures, however, are based on a declared catch and represent minimum catch statistics.

2.11 KEY DETAILS

CATCHMENT DETAILS

Area	208 km^2	
Population (1991 census)	64,643	
Main Towns (by ward)	Port Talbot	5,432
	Aberavon	5,939
	Baglan	6,815
	Margam	1,640
	Sandfields	12,913
	Taibach	4,842
	Bryn/Cwmafan	6,815
Population Density	310/km^2	

TOPOGRAPHY

Ground Levels	Max. level 568 m AOD	
Sea Levels (Port Talbot)	Mean High Water Springs	4.4 m AOD
	Mean Low Water Springs	-4.2 m AOD
Geology	Middle and upper coal measures, Carboniferous Limestone, Triassic Conglomerate and Glacial deposits	

ADMINISTRATIVE DETAILS

County Councils	West Glamorgan	91% of catchment area
	Mid Glamorgan	9% of catchment area
Borough Councils	Port Talbot	84% of catchment area
	Ogwr	9% of catchment area
	Neath	7% of catchment area
Local Flood Defence Committee (LFDC)	Glamorgan (GLFDC)	
NRA	Welsh Region - South West Area - Eastern District	
Water Company	Dŵr Cymru Welsh Water	
Sewage Treatment Works	2 non-Dŵr Cymru works	

WATER QUALITY

Length of Classified River in 1993	Class A	41.8 km	Class D	none
General Quality Assessment (GQA)	Class B	17.8 km	Class E	none
	Class C	4.0 km	Class F	none
Estuary Quality (1990 Survey)	Afan	Class B	2.0 km	
	Kenfig	Class A	1.9 km	
Designated under EC Freshwater Fisheries Directive (78/659/EEC)	Salmonid	16.7 km		

WATER RESOURCES

Average Annual Rainfall	1790 mm	
Total Licensed Abstraction	Industrial	237,469 Ml/a
	Agricultural/other	109.4 Ml/a
Total Number of Abstraction Licences	14	
Primary Gauging Station	Afan at Marcroft Weir	
Principal Reservoirs (volumes)	Cwm Wernderi	0.218 Ml
	Eglwys Nunydd	3.6 Ml

FLOOD PROTECTION

Length of Designated Main River	55 km
Length of River on which Flood Alleviation Schemes implemented	1.98 km
(Walls	1.54 km)
(Embankments	0.44 km)
Length of River covered by a Flood Warning Scheme	5 km

Note: The above statistics are estimates which will be refined following the compilation of a flood information database which has been approved by the GLFDC.

FISHERIES (Stats. relate to the Afan)

Declared Annual Migratory Rod Fish Catches (10 year average, 1982-91)	Salmon	Sea Trout
	1.8	121

Note: During the period, the first salmon to be caught in the Afan was in 1986.

3.0 ISSUES AND OPTIONS

This section of the Plan presents the key Issues that the NRA has identified from its analysis of the **Afan and Kenfig** catchments. 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 of the catchment which have been identified as failing to meet specific targets to support legitimate Uses. Significant areas of conflict between Uses are also discussed. Section 3.2 presents these Issues along with options to address them, identified by the NRA.

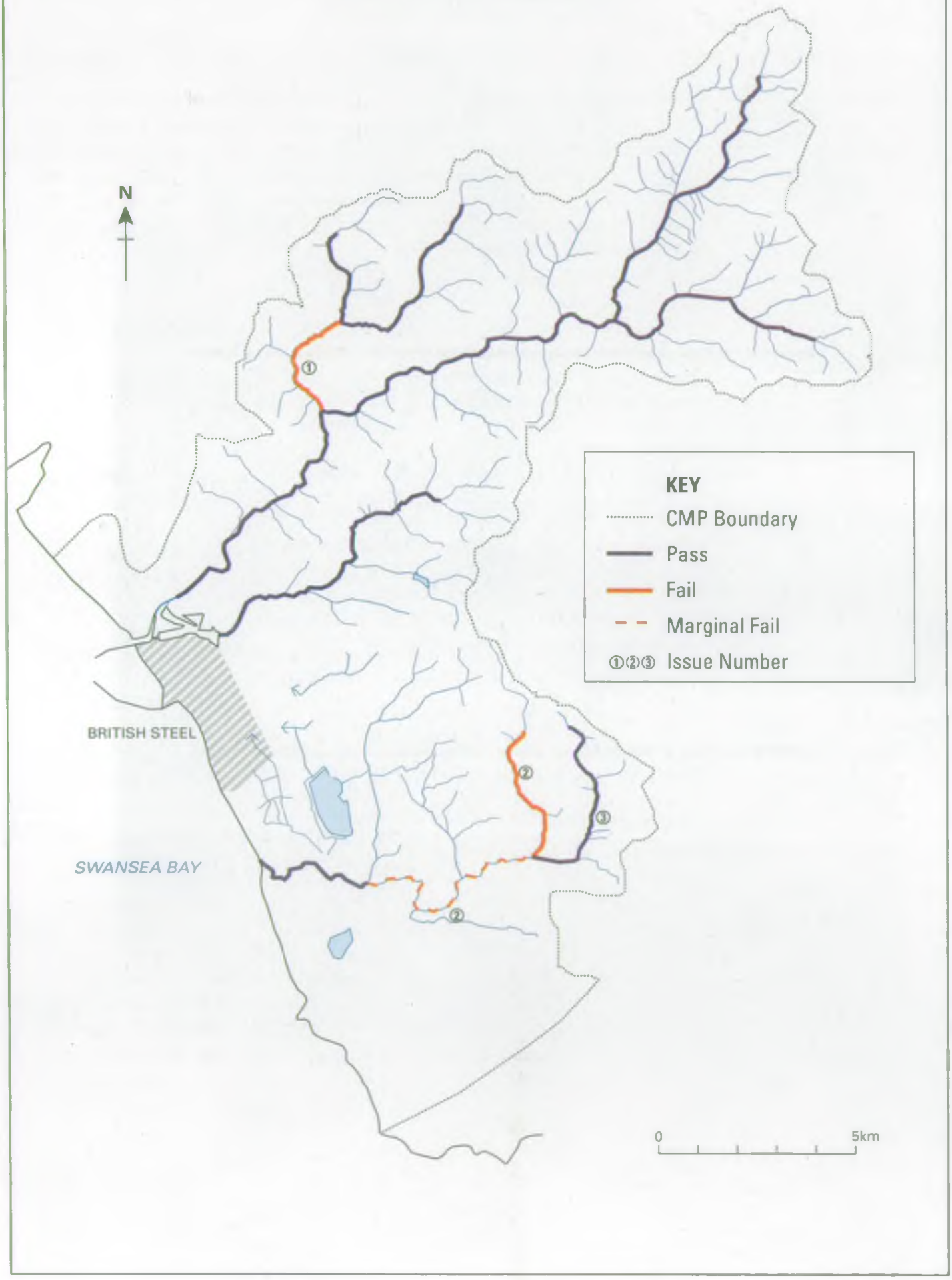
The information that has been used to identify these Issues is provided in **Part II** of this report which lists the known Uses of the catchment and sets targets to support them. You should note that the Issues and Options do not constitute NRA policy but have been considered within the NRA's policy framework; no priority should be inferred from the order in which they appear.

3.1 THE STATE OF THE CATCHMENT

The following section examines the ability of the catchment to support the Uses identified in Section 4, **Part II**, by assessing compliance with the targets set out in Section 5, **Part II**. In this way the key Issues in the catchment are identified. The potential solutions to these Issues are addressed in Section 3.2.

MAP 2.

STATE OF THE CATCHMENT-RIVER ECOSYSTEM (RE)



3.1.1 WATER QUALITY

General

The current state of the water quality of the Afan and Kenfig catchments has been assessed against the Use-related targets set in Section 5. This has been achieved largely by the use of data collected from routine sampling points for the past 3 years. In many of the smaller and headwater streams there is no requirement for the NRA to collect routine water quality data and in these reaches data from other sources has been used. These sources are often 'one-off' special surveys and the data cannot carry the same statistical certainty as those from routine points.

Since aquatic animals and plants have to endure the whole range of water quality at each site, biological data can be very useful in supporting the water chemistry data that only represent a series of 'snapshots' of the water quality. This is especially true in the smaller streams that are not routinely sampled. The Welsh Region of the NRA has developed a series of 'biological keys' based upon the presence and absence of certain indicator species, which can be used to detect intermittent or background problems such as acidification (acid rain) or farm pollution. Biological data is also used to qualify the results of much of the water chemistry data assessment. The Authority also routinely samples fish stocks at many sites. All these sources of data are used to assess the state of the catchment and identify areas where the targets set in Section 5 are not met.

The following sections and maps illustrate the results of this analysis: unless it is specifically stated otherwise, the catchment achieves its identified targets.

Issues Identified

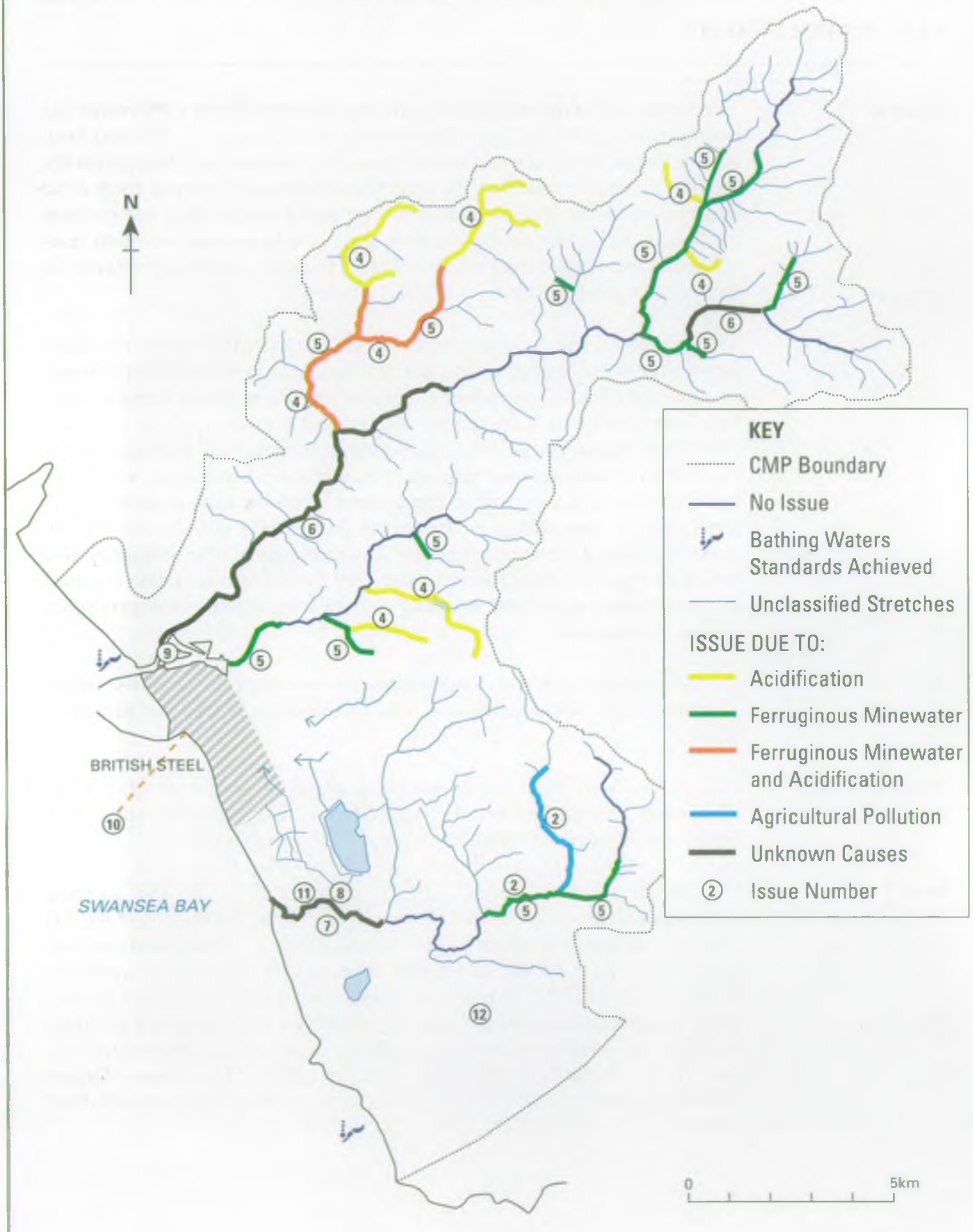
Failures to achieve River Ecosystem (RE) targets are shown on Map 2 and other water quality issues are shown on Map 3. The following areas have failed to meet the targets required to protect the identified Uses:

Issue 1

Biochemical Oxygen Demand (BOD) concentrations in the Pelenna immediately upstream of its confluence with the Afan, fail the target for RE Class 1, causing this stretch to fall into RE Class 2. This unsatisfactory quality is known to be due to periodic discharges from a faulty combined sewer overflow (CSO). Work was carried out during 1994 which initially appears to have resolved the problem. It is however still being monitored by the NRA. If works have been successful it is expected that this stretch will pass all the standards for RE Class 1 in the future. There is no further investment planned within Dŵr Cymru's second Asset Management Plan (AMP2).

MAP 3.

STATE OF THE CATCHMENT- GENERAL WATER QUALITY



Issue 2 The most upstream classified stretch of the Kenfig fails RE Class 1 targets in respect of BOD, causing it to fall into RE Class 2, and has poor biological quality. This unsatisfactory quality is due to discharges from farms along the stretch. This also affects the Kenfig, downstream of its confluence with the Iorwerth Goch, causing it to marginally fails its RE Class 1 target for BOD.

Issue 3 The Iorwerth Goch, immediately upstream of its confluence with the Kenfig, fails to achieve its Long Term River Quality Objective of RE Class 1, falling into RE Class 2, as a result of ammonia attributed to discharges from Bedford Road combined sewer overflow (CSO). The Kenfig downstream of the Iorwerth Goch is also thought to be affected by this CSO.

Issue 4 The most upstream classified stretches of the Gwenffrwd and the Blaenpelenna, the Nant Du, Nant y Ffin, Cwm Wernderi and the Cwm y Garn, all suffer from surface water acidification and impoverished biological quality.

Issue 5 Parts of the Pelenna, Corrwg, Corrwg Fechan, a tributary of the Cregan, Nant y Boda, Cwm Cerdinen, Gwynfi, Nant y Fedw, Afan, Ffrwd Wyllt, Kenfig and Iorwerth Goch are affected by pollution from ferruginous minewater discharges. The biological quality is poorer than the water quality would predict, and there is an aesthetic problem caused by the deposition of iron compounds from mine discharges, which stains the river beds orange. Some of these rivers may also be affected by surface water acidification, as is the case on the Pelenna.

Issue 6 Stretches of the Afan from the Gwynfi to the Nant y Fedw and from the Nant Cynon to the estuary have moderate biological quality. The cause in the former stretch is unknown, but may be due to organic pollution from combined sewer overflows. In the latter stretch, the cause is possibly due to acidification upstream of the Pelenna confluence. Organic pollution from CSOs is the possible cause of poor quality downstream.

Issue 7 The Kenfig downstream of the Castle Stream confluence has poorer biological quality than expected. The reason for this is unknown.

The following issues have also been identified as a result of routine investigations:

Issue 8 Caustic leachate from contaminated land downstream of Kenfig Industrial Estate discharges into the Kenfig, causing a localised aesthetic impact on the river and an area of alder wetland.

Issue 9 There continues to be a small discharge from the site of the old Mechema Chemicals plant, which contains elevated levels of toxic metals. Since the plant was closed and the contaminated land associated with the site was encapsulated, the volume of the discharge and the concentrations of the metals have fallen, but not ceased.

Issue 10 The Afan Sewage Outfall is currently used to discharge screened sewage to the Swansea Bay. The EC Urban Waste Water Treatment Directive requires provision of a treatment plant for this sewage by the year 2000. The normal requirement within this Directive for a secondary treatment plant has been reduced to provision of primary settlement as the outfall discharges to an area identified as a High Natural Dispersion Area. This is an area where the effects of dilution and dispersion should ensure that the discharge will have no adverse environmental impact. Comprehensive studies will be required to be undertaken by Dŵr Cymru to verify this situation.

Issue 11 In early 1994, pools of caustic liquid appeared in a field adjacent to the British Steel Morfa Landfill Site, part of the Margam Moors Site of Special Scientific Interest. Caustic materials have been deposited in the landfill by British Steel and their predecessors. Indications are that leachate from the tip may be escaping into and contaminating groundwater.

Issue 12 Analysis of groundwater samples obtained from boreholes adjacent to Stormy Down Landfill Site has identified some contamination of the groundwater with tip leachate.

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, or if groundwater levels were declining or groundwater quality deteriorating.

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.

The NRA has considered carefully the available surface and groundwater resources within the Afan and Kenfig catchments and their degree of utilisation. The following Section and Map summarise the results of this analysis. It must be stressed that where no problems or areas for further investigation have been identified, the NRA is satisfied that resources are adequate. As more information becomes available, for example about the actual flow requirements of the aquatic ecosystem, the NRA will review its resources management 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.

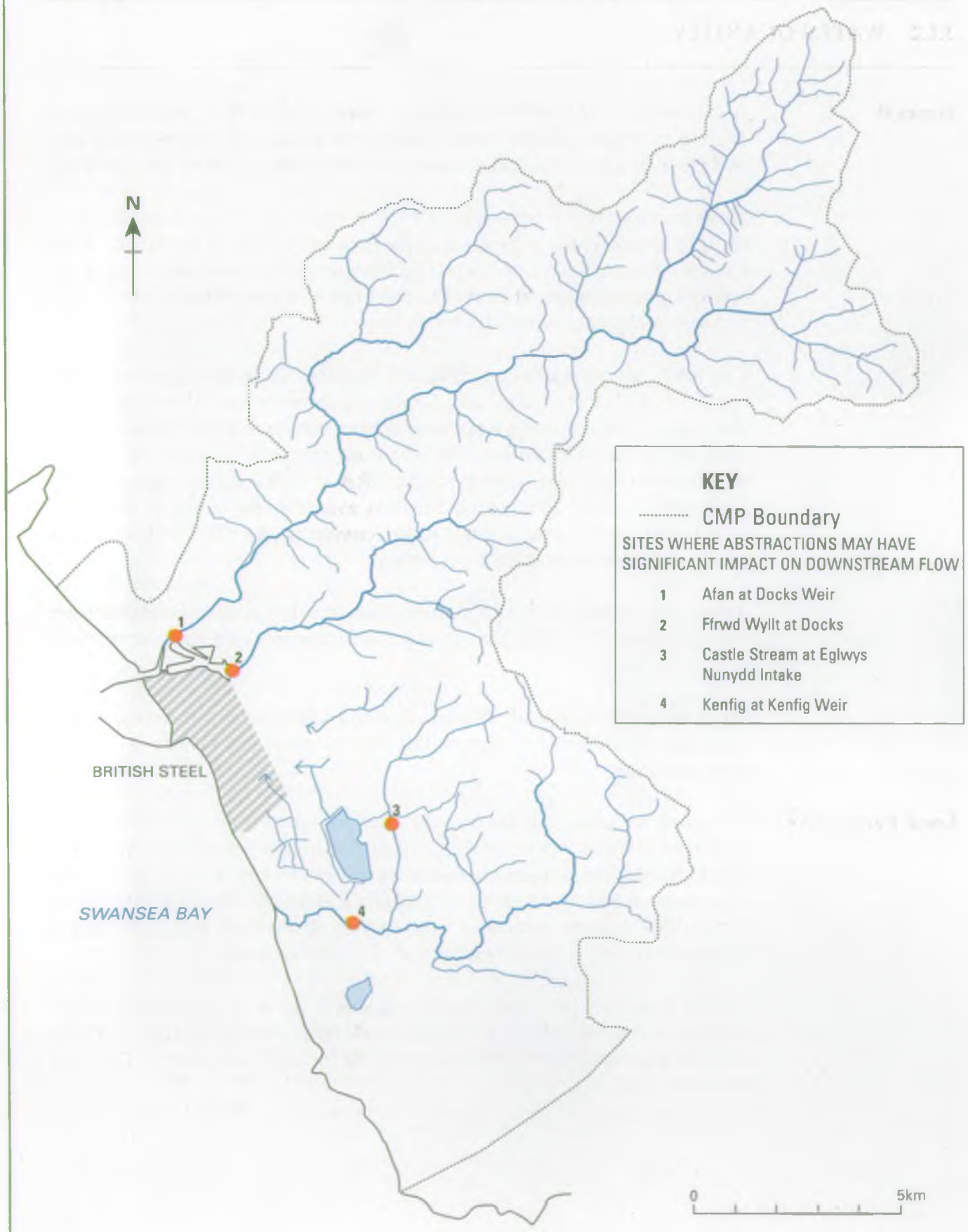
No allowance has been made for climatic change because future scenarios are uncertain and within the lifespan of this Plan (5 years) any change is unlikely to be significant.

Local Perspective

The scope for increasing the amount of water taken from the rivers in the catchment is limited by the need to protect the quantity of water available to British Steel. The company has licences of right to take a large proportion of the water in the lower reaches of the Afan, Kenfig and Ffrwd Wyllt. These abstractions, together with the Castle Stream abstraction, may also have a significant impact on the downstream aquatic environment.

The NRA has only two river gauging stations in the area, both on the Afan, and both in need of uprating to improve flow measurement accuracy. There is an NRA groundwater monitoring borehole located at Cornelly. This was drilled in 1994.

MAP 4. STATE OF THE CATCHMENT- WATER QUANTITY



Issues Identified

Issue 13

Prior to the completion of a regional abstraction licensing policy, the identification of locations where flows are inadequate to meet needs of migratory fish and riverine ecosystems cannot be specifically stated. Comparison of prescribed or residual flows with 95 percentile flows gives an indication of the locations that should be the primary focus for study when satisfactory methods are available. They may not necessarily subsequently be identified as problems. The locations so identified are all related to abstractions by British Steel:

(a) The water in the channel taking water from the Afan to Port Talbot Docks (the Afan Docks Feeder) has been considered to be a transfer of water for the purposes of a Navigation Authority performing its functions as such an Authority (ie. to maintain levels in the docks) and is thereby exempt from licensing control. Although the abstractions from the Afan Docks Feeder and the docks are individually licensed, the flow in the feeder itself is not limited. The licence to abstract from the Afan Docks Feeder entitles British Steel to 56 % of the 95 percentile flow at the Afan Docks Weir. The potential impact could be higher when water over and above this quantity continues along the Afan Docks Feeder to the dock basin. The fish pass in the Afan Docks Weir needs a sustained flow to operate efficiently. The status and the site of competing demands during periods of low flow needs to be investigated.

(b) There is a Licence of Right for a British Steel abstraction from the Kenfig, facilitated by a structure containing a tilting weir arrangement. This licence permits a level of abstraction that could dry the Kenfig downstream of this point for 38% (more than 4 months) of an average year (the situation having been aggravated by the closure of Marlas sewage treatment works which used to discharge a substantial flow into the river). British Steel do allow a residual flow to continue through a weir pass but no binding agreement exists to guarantee an adequate flow downstream. Further work needs to be undertaken on how much water is required in the lower reaches of the Kenfig and how this quantity can be achieved and enforced, whilst still ensuring adequate supplies for British Steel.

(c) The Castle Stream abstraction is authorised by the same licence as the Kenfig abstraction. There is an agreement to allow a residual flow of 2.273ml/d to continue below the abstraction point. This specified quantity only constitutes some 56% of the 95 percentile flow at the point of abstraction. Further investigations are required to establish whether this flow is adequate, and ways in which any low flow problems can be alleviated.

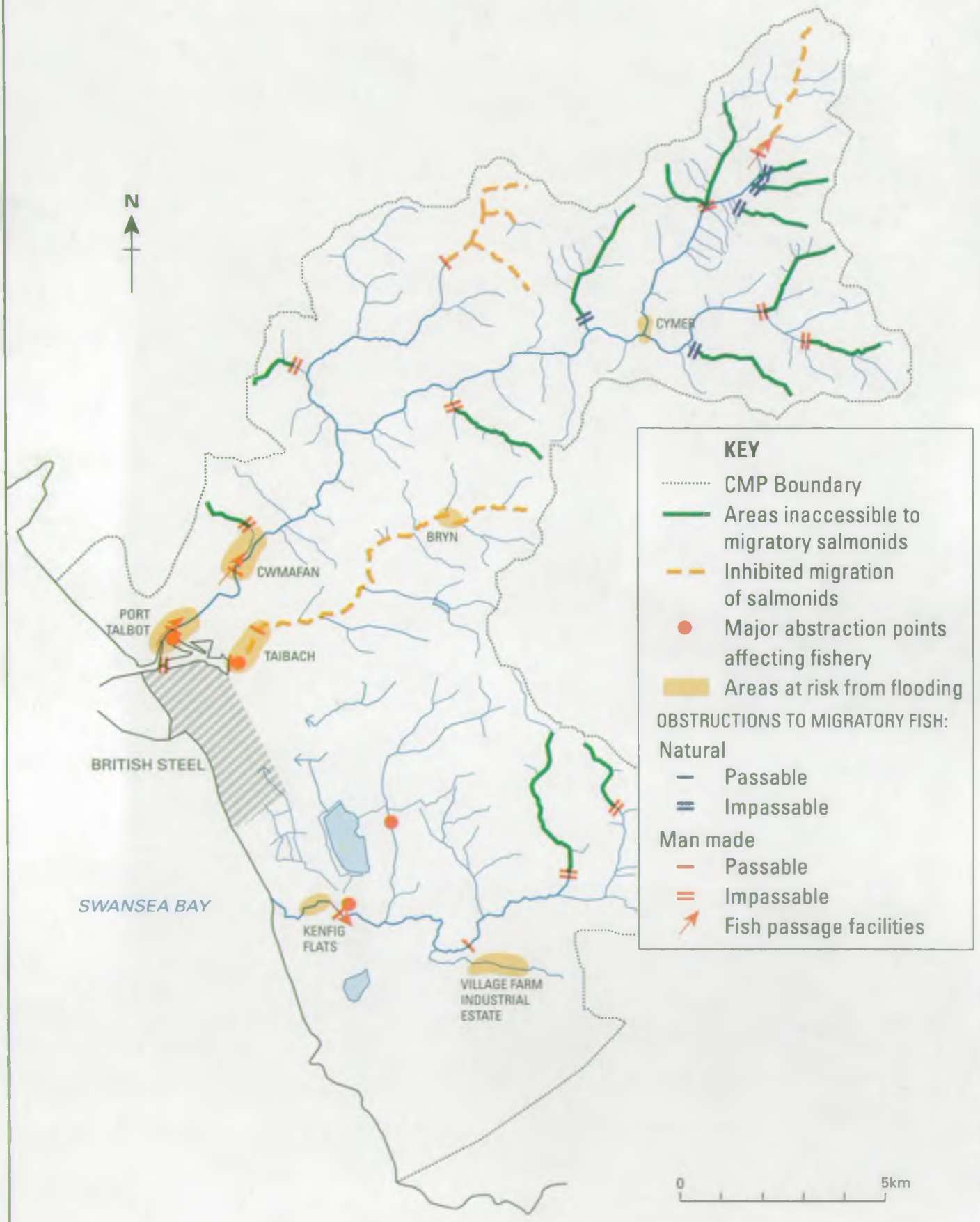
(d) British Steel hold a Licence of Right to abstract a quantity of water from the Ffrwd Wyllt at a rate that is slightly higher than the 95 percentile flow. Although the licence is not fully utilised at present, there is the potential to dry this river and prevent inflow to the dock for some three weeks of an average year. Further investigations need to be undertaken to establish whether there is a need to review the manner in which this abstraction is managed should it need to be fully utilised in the future.

Issue 14

The only two river gauging stations in the catchment are on the Afan, and neither of these is currently able to provide good quality data. A hydrometric review of the catchment needs to be undertaken to assess the benefits and costs of installing additional monitoring facilities.

MAP 5.

STATE OF THE CATCHMENT- PHYSICAL FEATURES



3.1.3 PHYSICAL FEATURES

General

Since Physical Features targets are the most subjective (Section 5.3) it follows that much of the assessment of the state of the catchment must be similarly subjective. 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.

Issues Identified

Issue 15

The upstream migration of salmonids is impeded by several natural and artificial barriers. Whilst easement has been provided at some structures, the feasibility of facilitating fish passage at other obstructions should be considered, taking into account the cost/benefits, ecological impact and landscape implications of such activity. The following locations need to be considered, which are prioritised in a list of obstructions in the District as follows: Corrwg Culvert, Kenfig Mill Weir (Pyle), Ffrwd Wyllt Grids, Aberbaiden Weir and Culvert, Nant Cynon, Ffrwd Wyllt Cemetery Weir and Kenfig Weir. Whilst a fish pass has been constructed at the tidal Afan Docks Weir in Port Talbot it is believed to be relatively inefficient due to the entrance to the pass being sited below the main holding area of the migratory fish. There is a need for modifications at this location.

Issue 16

Suitable spawning gravels are believed to be limiting salmonid production in the Afan and there is therefore a need to increase the availability of suitable spawning substrate.

Issue 17

Invasive and alien plant species, in particular Japanese knotweed, which is present in many parts of the catchment, pose a threat to the native flora and fauna, inhibit bankside access and can contribute to the flooding risk. Effective methods of control should be sought and implemented where appropriate.

Issue 18

Areas of degraded wetland and riverine habitat will be identified with the help of the strategic River Corridor Survey of the catchment, and a programme of restoration and improvement prepared.

Issue 19 The NRA has yet to agree formally with the Countryside Council for Wales a "Standard of Service" for Sites of Special Scientific Interest (SSSIs).

Issue 20 Poaching is a severe problem in the catchment, which has escalated as fish stocks have improved. Poachers use illegal nets along the foreshore and in estuaries, whilst in-river poaching principally comprises of snaring, gaffing, snatching and spearing. This activity conflicts with the proper management of the fishery as defined by the duty of the NRA to maintain, improve and develop fisheries.

Issue 21 For many years the Afan Docks Feeder has not been gridded, thus permitting a proportion of smolts to descend into the docks and preventing them from completing their natural life cycle. This has hampered the recovery of the migratory fishery.

Issue 22 The removal of gravel shoals from the river channel, particularly in the urban areas, is necessary in order to maintain channel capacity and existing flood protection standards. The cost of removing and disposing of gravel shoals has increased significantly in recent years and this threatens the viability of the operation.

Issue 23 The levels of flood protection in the Cwmafan area and Taibach are not known precisely but are believed to be below the indicative standard for residential areas. For other flood risk areas, the existing maintenance programme will continue in order to safeguard existing flood protection standards.

Issue 24 Fallen trees pose a risk to flooding and therefore require management to prevent loss from banksides.

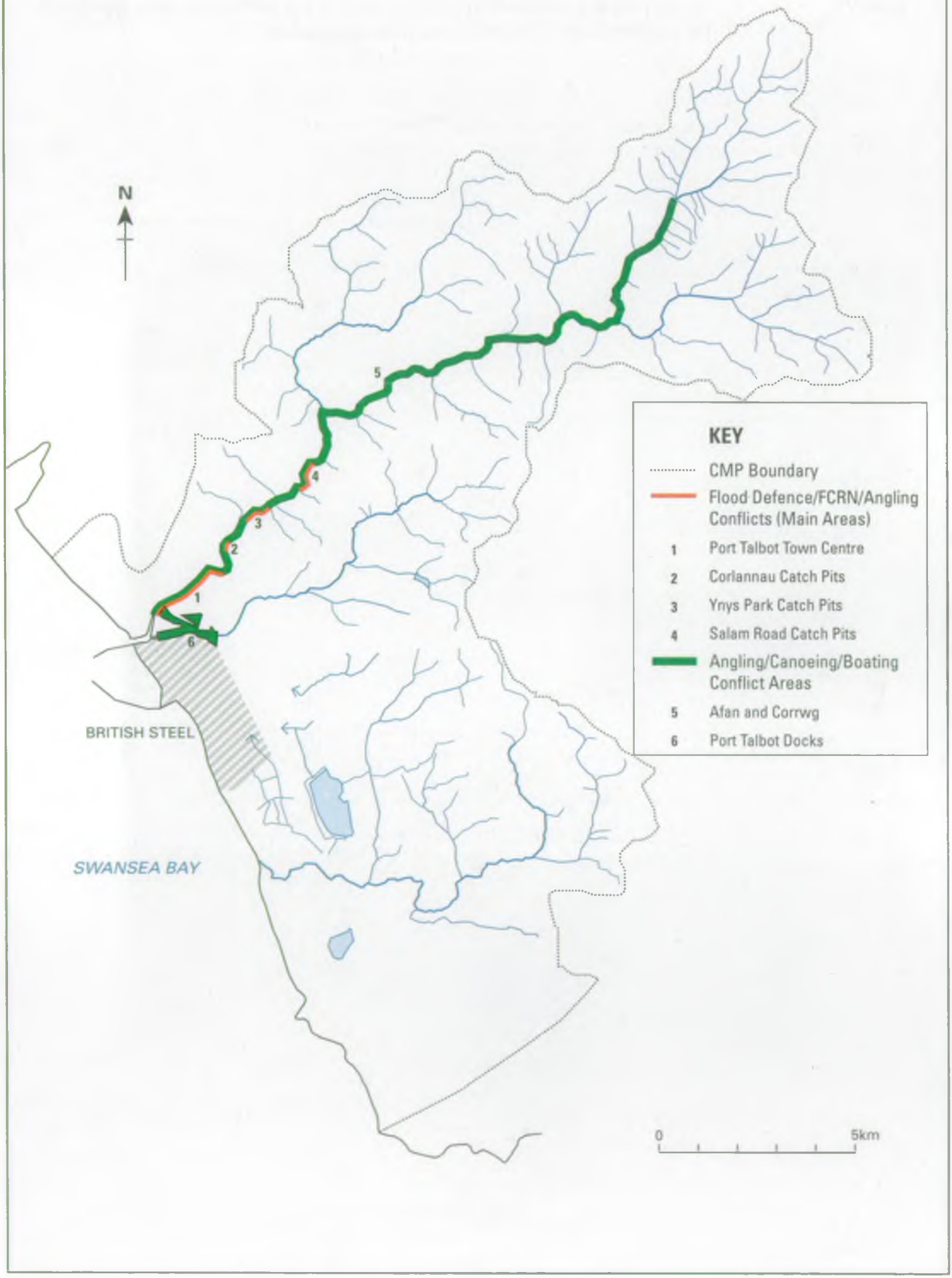
Issue 25 The Government has indicated that the main NRA input to development plan preparation regarding flooding issues should be via surveys undertaken by the NRA as required under Section 105(2) of the Water Resources Act 1992. These surveys will identify the extent of land liable to flood and will highlight any likely flood defence problems. Surveys for all catchments will be undertaken by 1998. A detailed programme for this work is currently being developed.

Issue 26 General lowering of beaches and sand loss has been noted, particularly along Port Talbot sea front and this has caused damage to coastal defences.

Issue 27 Flood warnings currently issued for the Port Talbot area are based upon river levels recorded at Cwmafan. The level of service provided for this catchment is thought to be below the target standard of service.

Issue 28 Flood protection standards to property at Pyle are below indicative standards for residential areas due to a poorly designed screen.

MAP 6. CONFLICTS BETWEEN USES



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 Afan & Kenfig catchments.

Local Perspective

Set out below are significant areas of conflict identified within the catchment. It is suggested that a change in mode of operation by the use/interest listed last in the margin (in bold) should be considered: options for solving these issues are provided in Section 3.2.

Conflicts Identified

Flood Defence/ **Development**

Extensive development within the catchment, particularly within flood plains, can impact on flood defence standards by increasing runoff, reducing/restricting channel capacity, interfering with access along the watercourse for maintenance purposes, reducing the opportunities to construct new flood defences, and putting the development itself at risk. Any development which takes place should only proceed on the basis that it does not adversely affect flood defence operations **(Issue 29)**.

Conservation/ **Development**

Bankside development and changes in land use can impinge upon the conservation value of the river corridor and, in particular, reduce bankside cover for fish and birds and prevent the passage of otters as they recolonise the South Wales catchments **(Issue 30)**.

Fisheries/ **BS Abstraction**

British Steel abstractions, authorised by Licences of Right, affect the passage of fish up to and over the Afan and Kenfig Weirs during periods of low river flow **(see Issue 13, Section 3.1.2)**.

Canoeing/ **Angling**

Canoeists are attracted to the Afan by the scenery and challenging water conditions. However, the controlling angling club are adamant that canoeists will not be permitted access under any circumstances **(Issue 31)**.

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 West Area, Welsh Region of the NRA and do not constitute policy statements. Comments on the issues and options are invited together with any new ideas/suggestions.

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.

Local Perspective

The following abbreviations have been used in the Issues and Options tables:

ABP	Associated British Ports
AMP	Asset Management Plan
AVAA	Afan Valley Angling Association
BOD	Biochemical Oxygen Demand
BS	British Steel
CCW	Countryside Council for Wales
CSO	Combined Sewer Overflow
DCWW	Dŵr Cymru Welsh Water
DoE	Department of the Environment
EC	European Community
HMIP	Her Majesty's Inspectorate of Pollution
KHDAA	Kenfig Hill and District Angling Association
LA	Local Authority
MGCC	Mid Glamorgan County Council
NBC	Neath Borough Council
OBC	Ogwr Borough Council
PTBC	Port Talbot Borough Council
RCS	River Corridor Survey
RE	River Ecosystem
RSPB	Royal Society for the Protection of Birds
SSSI	Site of Special Scientific Interest
WCA	Welsh Canoeing Association
WDA	Welsh Development Agency
WGCC	West Glamorgan County Council
WO	Welsh Office

Issue No: 1	Blockages in a sewer have led to discharges of sewage from a combined sewer overflow (CSO). This has caused the Pelenna immediately upstream of its confluence with the Afan to fail RE Class 1 targets for BOD.		
OPTIONS	Responsibility	Advantages	Disadvantages
Improve and maintain the CSO and the sewer to prevent blockages (some work has already been completed).	DCWW	Will improve water quality towards RE Class 1 standard.	Cost: unknown. May require more extensive work than originally anticipated, although this is not currently planned within current AMP2 programme (1995-2000).
Inspect CSO more regularly so blockages can be identified and cleared more quickly.	DCWW	Will improve water quality towards RE Class 1 standard.	Long term cost implication. Blockages may still occur.

Issue No: 2	The most upstream stretch of the Kenfig fails to meet RE Class 1 targets for BOD, falling into RE Class 2 and has poor biological quality. The Kenfig, downstream of its confluence with the Iorwerth Goch, to its confluence with the Castle Stream, also has marginally elevated levels of BOD. This is due to discharges from farms.		
OPTIONS	Responsibility	Advantages	Disadvantages
Identify problems and discuss remedial measures.	NRA/Farmers	Problem discharges identified.	NRA costs: £1k
Undertake improvements to farm effluent management systems.	Farmers	Will improve water quality towards RE Class 1 standard.	Cost: depends on problems identified.

Issue No: 3	The lower reaches of the Iorwerth Goch fall into RE Class 2, failing to achieve the Long Term River Quality Objective (LTRQO).		
OPTIONS	Responsibility	Advantages	Disadvantages
Improve the Bedford Road CSO and its associated sewers to reduce its impact.	DCWW	Improved water quality and possibly aesthetic biological and quality.	Cost: to be determined. Investment not planned within current AMP2 programme (1995-2000). Timescale depends upon Regional priorities.

Issue No: 4	Poor biological quality caused by surface water acidification in the upstream stretches of the Gwenffrwd, Blaenpelenna, Nant Du, Nant y Ffin, Cwm Wernderi and Cwm y Garn.		
OPTIONS	Responsibility	Advantages	Disadvantages
Investigate cause of acidification and the possible impact of unusual local circumstances	NRA	Improved knowledge of the problem and the possibility of identifying practical solutions	Cost: c.£20k
Investigate practicability and cost-effectiveness of liming appropriate sub-catchments.	NRA/other funding agencies	Improved water quality, biological and fisheries quality. Feasibility study underway for work on the Gwenffrwd and Blaenpelenna.	Cost: unknown Possible localised impact on terrestrial communities Cost: £25-28k p.a.
Continue to pursue and support initiatives to reduce emissions of acidic gases.	NRA/HMIP/ Government/ Industry	More widespread water quality benefits.	Cost: unknown. Timescale for improvements difficult to predict.
Changes to forestry practice.	Forest Enterprise	Improved water quality.	May not be cost-effective. Likely to have an impact on timber production. May not achieve adequate water quality improvements in every case.

Issue No: 5	Poor biological and aesthetic quality in parts of the Afan, Pelenna, Corrwg, Corrwg Fechan, a tributary of the Cregan, Gwynfi, Nant y Fedw, Nant y Boda, Cwm Cerdinen, Ffrwd Wyllt, Kenfig and Nant Iorwerth Goch caused by discharges from abandoned mines. There is a possibility that these discharges may be masking the impact of surface water acidification in some sub-catchments.		
OPTIONS	Responsibility	Advantages	Disadvantages
Treat minewater discharges.	Local and National Government/other funding agencies/ Coal Authority/ Private mine owners	Improved water quality. Work underway on the collaborative NRA/WGCC demonstration project on the Pelenna, funded by EC/WDA	Cost: unknown. Funding will need to be allocated. Cost: £1.3m for Pelenna project alone.
Develop methods for treating minewater, pending resolution of funding problem (as is underway on the Pelenna).	NRA/Central and Local Government/ European Community	Project work could improve estimates of cost and feasibility. Possibility of improved water quality	Cost: may be substantial. Currently no funding available for implementation. Treatment is technically difficult.
Carry out further survey work to differentiate between the impact of minewaters and surface water acidification.	NRA	Improved knowledge of catchment. Improved prioritisation of problems.	Cost: £3k

Issue No: 6	Unsatisfactory biological quality in parts of the Afan.		
OPTIONS	Responsibility	Advantages	Disadvantages
Undertake a biological survey of the Afan to confirm the poor biological quality, to establish its extent and to identify possible causes.	NRA	Extent of poor biological quality confirmed and quantified. Possibility of identifying measures to improve biological quality.	Cost: c.£2k May not identify solutions.

Issue No: 7	Unsatisfactory biological quality in the lower Kenfig.		
OPTIONS	Responsibility	Advantages	Disadvantages
Investigate the cause of poor biological quality and implement remedial actions as required.	NRA	Possibility of improved biological quality.	Cost: c.£2k May not identify solutions.

Issue No: 8	Caustic leachate from contaminated land below Kenfig Industrial Estate discharges into the Kenfig.		
OPTIONS	Responsibility	Advantages	Disadvantages
Investigate the impact of the discharge, and consider options for amelioration.	WDA/NRA	Increased knowledge of the impact.	Cost: £2.5k
Implement remedial actions if appropriate.	WDA	Possibility of improved environmental quality.	Cost: unknown

Issue No: 9	The site of the old Mechema Chemicals plant (now closed) continues to produce a very small discharge containing toxic metals.		
OPTIONS	Responsibility	Advantages	Disadvantages
Continue to monitor the discharge and its impact.	NRA	Safeguards the Afan Estuary. Ensures success of encapsulation of the contaminated site is established.	Cost: c.£2k

Issue No: 10	Improvements to the Afan Sewage Outfall are required under the provisions of the EC Urban Waste Water Treatment Directive (UWWTD).		
OPTIONS	Responsibility	Advantages	Disadvantages
Carry out a study to assess the quality and dispersion characteristics of the receiving waters and the impact of the discharge.	DCWW	Required by UWWTD. Improved knowledge of receiving water.	Cost: unknown (Extent of study not yet defined by EC: no timescale as yet).
Install primary sewage treatment by 2001.	DCWW	Required by UWWTD. Improved water quality offshore.	Cost: c.£7.4m Comprehensive studies may demonstrate the need for secondary treatment.
Interim arrangements to improve screening of sewage at Afan Outfall, pending completion of the above primary sewage treatment (work underway).	DCWW	Reduce discharge of persistent plastic debris, improving appearance of local beaches, reducing fouling of fishing nets and impact on the environment.	Cost: £60k

Issue No: 11	There is some evidence that leachate from the Morfa Landfill Site is contaminating groundwater.		
OPTIONS	Responsibility	Advantages	Disadvantages
Investigate the extent and severity of any escapes of material from the tip and methods of addressing any problems identified.	British Steel	Safeguards controlled waters and the Margam Moors SSSI. Facilitates improved management of the tip.	Cost: £17k (study underway)
Using results of the above, the NRA will press for the Waste Disposal Licence to include improved monitoring and management.	PTBC/NRA	Safeguards controlled waters and the Margam Moors SSSI.	Cost: PTBC £2k NRA £0.5k

Issue No: 12	Monitoring at Stormy Down Landfill site has identified some contamination of groundwater with tip leachate.		
OPTIONS	Responsibility	Advantages	Disadvantages
Improve monitoring to ascertain the extent and severity of the contamination.	Springfield Disposal	Safeguards groundwater. Provides the operator with a better estimate of the size of the problem.	Cost: £10k
Using the results of the above the NRA will press for the Waste Disposal Licence to include improved monitoring and measures to control the discharge.	OBC/NRA	Safeguards groundwater.	Cost: OBC £1k NRA £0.5k

Issue No: 13	British Steel, by virtue of Licences of Right, is authorised to abstract quantities of water from the Afan, Kenfig, Castle Stream and Ffrwd Wyllt that may be detrimental to the aquatic environment.		
OPTIONS	Responsibility	Advantages	Disadvantages
Undertake a study to assess the impact of the abstractions on the watercourses concerned.	NRA	Increased knowledge of catchment.	Cost of study.
Review British Steel's requirements to identify most effective way of balancing demands with environmental needs.	NRA/BS/ABP	Integrated approach to management of BS's multiple licences.	

Issue No: 14	There is an inadequate hydrometric monitoring network within the catchment.		
OPTIONS	Responsibility	Advantages	Disadvantages
Undertake hydrometric review of the catchment to assess benefits and cost of installing monitoring facilities.	NRA	More accurate flow assessment to enable better determination of licences and consents.	Adequate monitoring facilities are expensive to provide.

Issue No: 15	Impaired migration for salmonids due to man-made obstructions.		
OPTIONS	Responsibility	Advantages	Disadvantages
Identify easements required.	NRA	Appropriate solutions identified. Cost/benefit analysis undertaken	Cost: c.£2k
Negotiate with riparian owners, the possibility of easements.	NRA/Riparian Owners	Increased natural productivity.	Increase in vulnerable poaching areas. Cost: dependent on particular location and scheme proposed.

Issue No: 16	Availability of suitable spawning substrates for migratory fish.		
OPTIONS	Responsibility	Advantages	Disadvantages
Identify areas deficient in suitable spawning gravels.	NRA	Enable prioritisation of remedial measures.	Cost: £2k.
Plan remedial measures in conjunction with riparian interests.	NRA/AVAA/ KHDAA/Riparian Owners	Plan for action produced and agreed. Collaborative projects.	
Instigate remedial measures as and when opportunities arise (will require co-operation of third parties).	NRA/Other bodies	Increased productivity of migratory fish stocks.	Loss of amenity during maintenance. Third party agreements may be difficult to achieve.

Issue No: 17	Invasive weeds are present throughout the plan area.		
OPTIONS	Responsibility	Advantages	Disadvantages
Continue to implement effective and co-ordinated control measures within the catchment.	NRA/NBC/PTBC/ OBC/WDA/CCW/ Riparian Owners	Improved native habitat. Improved access. Reduce spread of invasive species.	Cost of activity. Resource implication of co-ordination. Re-invasion always possible.
Refine methods and adopt "best practice".	As above	Reduce cost of activity, find effective method of eradication.	
Increase public awareness about invasive weeds and control measures by the strategic distribution of the NRA leaflet, "Guidance for the Control of Invasive Plants near Watercourses".	NRA	Increase public awareness. Prevention of spread of invasive weeds.	

Issue No: 18	There is a need to review the recently completed River Corridor Survey (RCS) data to identify habitats in need of restoration/ improvement.		
OPTIONS	Responsibility	Advantages	Disadvantages
Review RCS data.	NRA/CCW/RSPB/ AVAA/KHDAA	Identify those areas requiring improvement/special protection.	Cost: £1k
Seek to secure collaborative schemes where improvements identified.	As above/ Riparian Owners/ Land Owners	Improvement in habitat diversity and abundance.	Costs may be high.

Issue No: 19	"Standards of Service" for SSSIs have not been formally agreed with CCW.		
OPTIONS	Responsibility	Advantages	Disadvantages
Agree "Standards of Service" and implement.	NRA/CCW	SSSIs safeguarded.	Cost: unknown.

Issue No: 20	Illegal fishing reduces stocks of fish for *bona fide* angling and spawning.		
OPTIONS	Responsibility	Advantages	Disadvantages
Continue enforcement of legislation in an effective and co-ordinated manner.	NRA	Protects stocks for legitimate harvesting and spawning.	Ongoing cost of activity.
Review the effectiveness of all byelaws and introduce new proposals where necessary (ongoing).	NRA	Protects stocks for legitimate harvesting and spawning.	

Issue No: 21	Loss of smolts from Afan into Port Talbot Docks.		
OPTIONS	Responsibility	Advantages	Disadvantages
Erect a removable smolt exclusion grid at the mouth of the Afan Docks Feeder.	ABP/NRA	Reduce loss of smolts and consequently improve returns of adult salmon and sewin to the Afan. Reduced debris intake into the docks.	Capital cost: £5k Cost of ongoing maintenance of grids.

Issue No: 22	Need to reduce gravel removal costs and the impact of the activity on the water environment.		
OPTIONS	Responsibility	Advantages	Disadvantages
Review existing operations and identify sites where gravel catchpits can be constructed.	NRA	Reduced costs of removal and haulage of gravel. Improved flood protection standards. Reduced disturbance by limiting dredging operations to specific sites. Reduced loss of amenity to anglers. Catch pits may provide suitable angling pools and spawning gravels.	Cost. Disturbance during construction of catch pit areas.

Issue No: 23	Flood protection standards at Cwmafan and Taibach are believed to be below the indicative standard for residential areas.		
OPTIONS	Responsibility	Advantages	Disadvantages
Determine existing levels of flood protection and feasibility of undertaking improvement works. If considered necessary and feasible, undertake improvement works or increase channel maintenance.	NRA	Increased standard of flood protection to property at risk of flooding.	Cost of improvement works or increased maintenance. May be detrimental environmental impacts.

Issue No: 24	Flood risk caused by fallen trees.		
OPTIONS	Responsibility	Advantages	Disadvantages
Develop and implement a tree management programme.	NRA	Reduce flood risk to downstream properties. Maintain bankside stability. Optimise tree cover in the river corridor. Protect bankside ecology.	Cost: £10k.

Issue No: 25	S105 surveys are required to identify the extent of lands liable to flood.		
OPTIONS	Responsibility	Advantages	Disadvantages
Undertake S105 survey for the Afan and Kenfig catchments.	NRA	Flood plain and flood defence problems identified to enable the NRA to advise Local Planning Authorities (LPAs) for Local District Plan preparation. NRA better placed to advise LPAs and developers on impacts of proposed development and on possible measures to offset such impacts.	Cost: £50k

Issue No: 26	Sand is being lost from beaches in Swansea Bay, including Port Talbot, threatening the stability of coastal defences/structures.		
OPTIONS	Responsibility	Advantages	Disadvantages
Studies undertaken in 1993 (NRA, LAs, CCW, private interests) have helped to explain the physical processes which affect sand movement within Swansea Bay. Further studies are required and have been proposed by DoE.	DoE	Physical processes better understood. Ability to respond properly to dredging proposals.	Cost of study: not known.
In the interim, take a precautionary approach to dredging applications.	NRA/WO/Local Authorities/Other consultees	Prevention of additional coastal erosion and lowering of defences.	May limit dredging proposals unnecessarily

Issue No: 27	Standards of service for flood warning in the Port Talbot area may be below the NRA's target level.		
OPTIONS	Responsibility	Advantages	Disadvantages
Review existing levels of service for the catchment and develop and implement flood forecasting model if appropriate and cost-effective.	NRA	Provide improved flood warnings to public.	Cost of developing model, if appropriate.

Issue No: 28	Flood protection standards for property at Pyle due to poor screening arrangements.		
OPTIONS	Responsibility	Advantages	Disadvantages
Initiate review of current arrangements for reducing risk of culvert blockage.	NRA/Railtrack	Confirm role and responsibilities of interested parties. Determine possibility of improvements to current arrangement to reduce flooding.	Cost of negotiation.
Design and replace existing screen.	Railtrack	Reduce flood risk to property at Pyle.	Cost of installation and future maintenance/ operation.

Issue No: 29	Development on flood plains and their conflict with flood defence requirements.		
OPTIONS	Responsibility	Advantages	Disadvantages
Close liaison between NRA and Local Authorities to ensure protection standards are no compromised.	NRA/NBC/PTBC/ OBC/WGCC/ MGCC/WO	No reduction in existing flood protection. Developer pays for any necessary mitigation works, rather than public.	Cost to developer.
Keep flood plains free from development.	WGCC/MGCC/ NBC/PTBC/OBC/ WO/NRA	Ensures that existing defences and river channel can be maintained at reasonable cost and new defences provided in future if required.	Reduction in land available for development.

Issue No: 30	The conservation value of the river corridor may be severely impacted by bankside developments and other changes in land use.		
OPTIONS	Responsibility	Advantages	Disadvantages
Protect a minimum of 7m from the river bank from all new developments.	NRA/Developers/ NBC/PTBC/OBC/ WGCC/MGCC/WO	Preservation of conservation value within river corridor.	Cost to developer.
Keep river banks free from new development.	WGCC/MGCC/ NBC/PTBC/OBC/ NRA/WO	As above	Cost: unknown

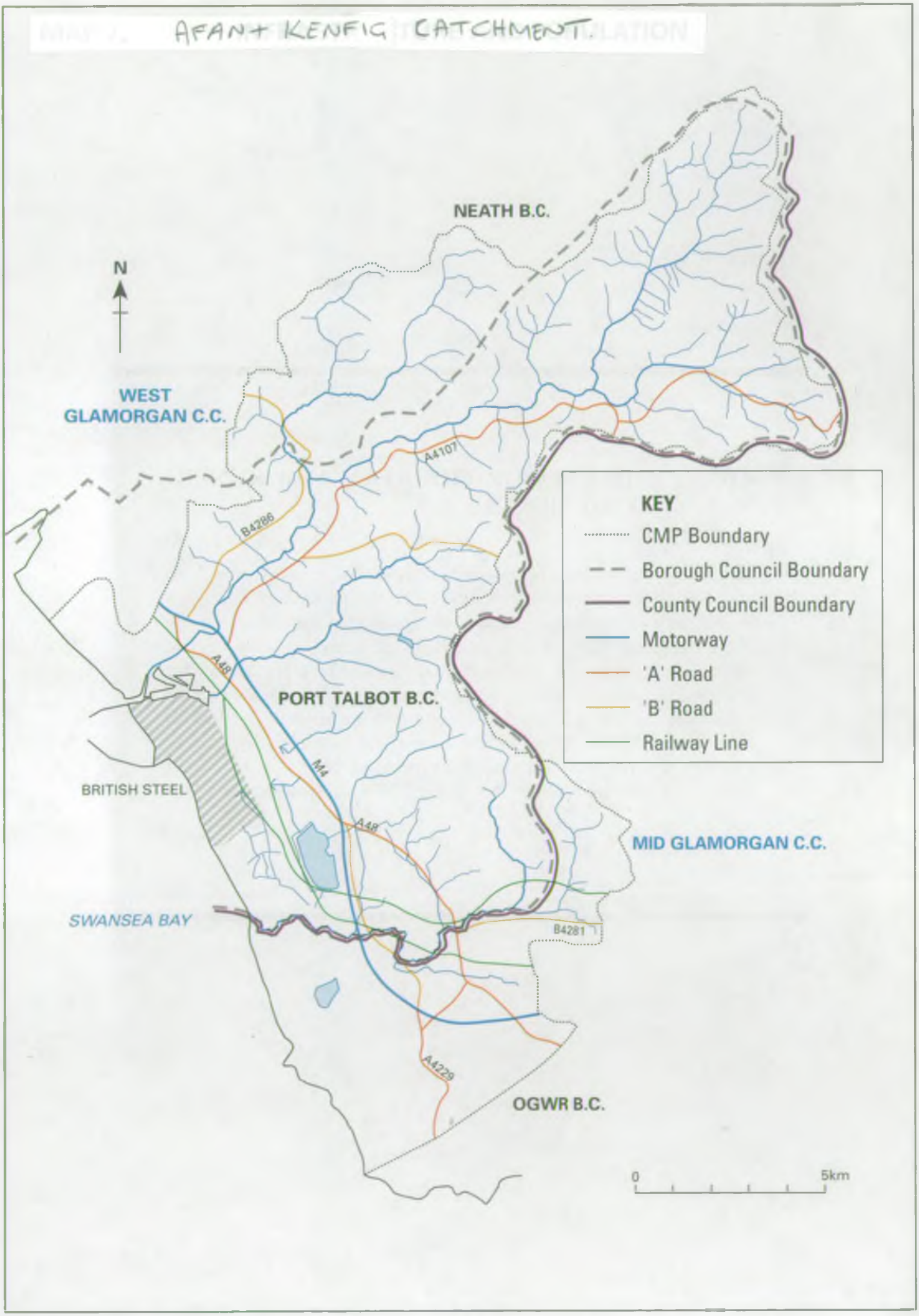
Issue No: 31	No canoeing access in private reaches of the Afan, Ffrwd Wyllt and Kenfig.		
OPTIONS	Responsibility	Advantages	Disadvantages
WCA to establish contacts with angling clubs in order to pursue access arrangements.	WCA	Increase recreational use of rivers. Possible income for angling clubs. More "eyes" on the river which may deter poachers.	Possible disturbance to fisheries, conservation and angling interests.

PART II

SUPPORTING INFORMATION

4.0 THE USES OF THE AFAN AND KENFIG CATCHMENTS

The following sections catalogue the legitimate Uses of the Afan and Kenfig catchments which fall under the control of the NRA in one way or another. A general description of the nature of the NRA's responsibility towards each is given, complete with a set of management aims and environmental quality targets. These are designed to protect both the environment and the requirements 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 the NRA's view of the balance of interests between the different users of water.


AFAN + KENFIG CATCHMENT
NEATH B.C.
N
WEST GLAMORGAN C.C.
A4107
B4286
A48
PORT TALBOT B.C.
M4
BRITISH STEEL
A48
MID GLAMORGAN C.C.
SWANSEA BAY
B4281
A4229
OGWR B.C.
KEY
CMP Boundary
Borough Council Boundary
County Council Boundary
Motorway
'A' Road
'B' Road
Railway Line
0
5km

4.1 URBAN DEVELOPMENT (including road and rail)

General

Development must be considered when planning the management of a river catchment because it can directly and indirectly affect other Uses. This Use is related to existing and predicted residential, commercial and industrial development that is identified in the county structure and district local plans. These plans identify policies against which planning authorities consider development proposals.

While the NRA has statutory powers and responsibilities to protect the water environment, these can be complemented by effective control of land use to prevent anticipated problems at an early stage.

The NRA is a statutory consultee under planning legislation and advises local authorities on development proposals that can have an impact on matters relevant to the NRA. Consequently, a major objective of this Catchment Management Plan is to provide the planning authorities with a clear picture of the NRA's responsibilities and policies towards development of this catchment. The Plan identifies all legitimate users of the catchment so that their interests can be taken fully into account during the planning process. This approach is consistent with the Government's declared objective of "plan led" development.

The NRA seeks to pursue its aims and policies regarding development through the planning consultation process. Although the final decision on planning matters rests with the planning authority, government guidelines advise on the need to consider the NRA's concern in determining proposals.

The NRA has produced a series of Guidance notes for LPAs that outline methods of protecting the water environment. The NRA proposes that these should be incorporated into the LPAs' own Development Plans, whenever possible.

Local Perspective

The catchment is situated mainly within the county of West Glamorgan, although the southern corner (Kenfig area) is within the County of Mid Glamorgan. The area covers the major part of Port Talbot Borough Council and parts of Neath Borough Council and Ogwr Borough Council.

The West Glamorgan Structure Plan (Review No 2) proposes that land be made available in the Port Talbot Borough for some 2,800 dwellings to be constructed over the next 10 years and this aim is reflected in the Port Talbot Local Plan Consultative Draft.

Much of this growth is likely to be accommodated in the existing towns and main villages with limited in filling in existing rural villages. However, Port Talbot Borough Council have included in their draft plan, a site for the provision of a new settlement (approximately 400 dwellings), Coed Hirwaun, situated south east of Margam Park. Currently there is no main public sewer in the vicinity and it should be noted that a private sewage treatment works may not be acceptable due to limited dilution in receiving streams.

The NRA has prepared statements for inclusion within County Structure Plans which refer to aims and policies in respect of development. It is considered that such reference directs developers to take the policies into account in the preparation of their plans.

Aims

To ensure that development does not adversely impact, and wherever possible, to ensure that it proceeds in a way that benefits, the water environment and its users.

To ensure that development does not impact on the water environment to a degree that threatens life and property.

Environmental Requirements

Water Quality

The water environment should not suffer any detriment due to development.

Adequate pollution prevention methods, that are consistent with the Groundwater Protection Policy and the NRA's Guidance Notes, should be incorporated into developments.

Water Quantity

To protect inland waters (and groundwater which is a locally important source of water supply) from the detrimental effects of development, including afforestation and other changes in land use.

Physical Features

Development should not be at risk from flooding and should not put other areas at risk of flooding which could endanger life and damage property.

Any work that is needed to reduce the risk of flooding created by a development is paid for by the developer and not from public funds.

Conservation features associated with the water environment should not suffer any detriment, and wherever possible should be enhanced by development.

4.2 FLOOD DEFENCE

General

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 30/92 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.

Water Level Management Plans will be drawn up for sites where flood defence works influence water levels and there is significant conservation interest. Sites and locations will be agreed with Countryside Council for Wales/English Nature and the plans will be developed in accordance with the guidance issued by MAFF/WO.

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 1994 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 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

Flood defences have been constructed on both the Afan and the Ffrwd Wyllt to protect Port Talbot from flooding and the NRA maintains these and the river channel's flow carrying capacity to minimise the risk of flooding. This involves regularly inspecting and maintaining flood defences, protecting them from erosion, removing gravel shoals and managing bankside vegetation.

Properties on the flood plain of the Afan in Port Talbot are protected against a flood likely to occur on average once every 100 years. These defences were constructed in the 1980's by raising and extending existing river walls through the town centre and the artificial channel created is regularly maintained. Having a relatively steep gradient the river generates a significant bed load and gravel traps are in operation at Corlanau and Salem Road. These traps are emptied once every three to five years. Upstream of the town centre, where the river passes through areas previously disturbed by industrial activity, the river banks are protected against erosion by extensive blockstone which requires regular attention and repair.

The Corrwg and Pelenna are the major tributaries of the Afan and have similar characteristics and problems to those of the Afan itself. There are however only limited protection works on these watercourses and flood defence operations are undertaken infrequently. The catchment does however suffer from Japanese Knotweed invasion and a regular programme of control is implemented throughout the catchment. The presence of Japanese Knotweed threatens the integrity of flood embankments by shading out the protective grass cover and after the plants have died, their remains can create blockage in the downstream river channel.

Property on the Ffrwd Wyllt flood plain in the Taibach area of Port Talbot is protected by flood defences designed to provide protection from flooding which might occur once in 100 years. Flood flows discharge to Swansea Bay through the Port Talbot Dock system via a long culvert. This culvert, which is owned by British Steel, is prone to blockage and its entrance is protected by a screen which collects waterborne debris. This screen is fitted with an alarm which indicates when water levels are high. When the alarm sounds British Steel attend to the screen and clears any debris from it. The upstream reaches are heavily wooded and the NRA operates a tree management programme to reduce the volume of debris brought downstream during flood conditions. The lower reaches are urban in nature and generate considerable litter which further increases the risk of blockage.

The Kenfig passes through an area of sand dunes before discharging into Swansea Bay. The generally unstable nature of these sand dunes can cause a reduction in the flow carrying capacity; flooding of land behind the dunes can occur. The impact of this flooding is limited to minor roads and work on the channel is undertaken infrequently. The watercourse is used as a direct supply to British Steel and, in order to maintain their supply, the Company carries out maintenance works on the section of watercourse adjoining its intake. This work benefits an adjacent industrial estate by reducing flooding of access roads.

Properties on the flood plain of the Afon Fach, a tributary of the Kenfig are vulnerable to flooding due to potential blockage of a railway culvert under the station at Pyle. This culvert is owned by Railtrack who have erected a screen at its entrance in order to protect it from blockage under flood conditions. This screen is cleared by the NRA using its permissive powers. The screen is of poor design and is liable to block quickly with debris following periods of heavy rainfall. Development in the catchment upstream of the culvert would increase flood risk at this site unless appropriate mitigation measures are implemented.

In the upper reaches of the Castle Stream, a tributary of the Kenfig, annual maintenance is undertaken of an historic land drainage scheme, without which the flooding of a minor road would occur.

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.

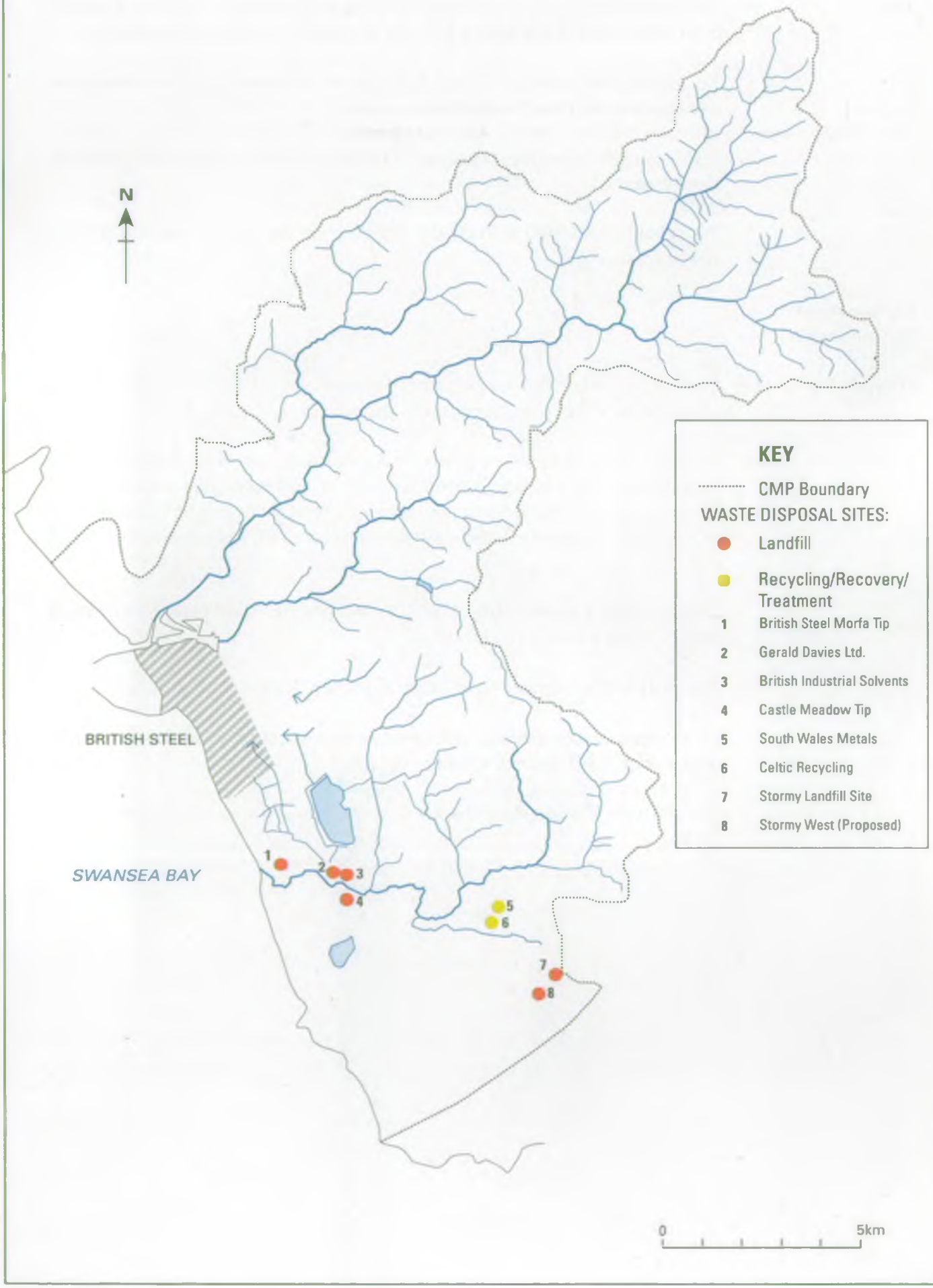
To ensure where possible that the effectiveness of the flood plain to store and convey flood waters is not impaired.

Adequate arrangements should be provided for flood warning.

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

Water Level Management Plans will be prepared for all sites agreed with CCW.

MAP 9. SOLID WASTE DISPOSAL



4.3 SOLID WASTE DISPOSAL (LANDFILL)

General

The disposal of domestic and industrial waste into landfill sites is a common form of waste disposal in England and Wales. All sites that receive material that is not inert have the potential to produce a toxic liquid effluent (leachate) which can pollute surface and groundwater. Consequently the NRA's 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 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 landfill waste disposal licences.

Local Perspective

There is one domestic waste disposal site within the catchment, Stormy Landfill Site. This site is situated in a former limestone quarry to the north of Porthcawl and produces no direct discharges to surface water. The site is approaching completion. It has no direct discharge to any watercourse but is in continuity with groundwater and pollution is evident (see Issue 12).

There is a British Steel landfill facility in the form of Morfa Tip. This is located between the Margam Moors Site of Special Scientific Interest, the Kenfig and Margam Sands. It has no direct discharge to any watercourse, although there is some evidence that leachate from the site is contaminating groundwater (see Issue 11).

There are several small landfill sites receiving inert waste, and several sites with waste management licences for transfer stations or scrap merchants. These in general do not pose a significant risk of pollution.

Of the abandoned disposal sites in the area, the site previously occupied by British Industrial Solvents in the 1940s and 1950s is the most significant. The site is now occupied by Kenfig Industrial Estate.

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.

Where appropriate waste disposal sites must comply with prohibition notices or discharge consent conditions. These will be enforced by the NRA and WRAs.

Water Quantity

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

The NRA's Position Statement regarding groundwater issues 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 must be carried out by those responsible.

4.4 FISHERIES

General

The Fisheries Use addresses the protection, maintenance and improvement of fish stocks within the catchment: angling is covered in Section 4.13 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 only used for the passage of migrating fish such as salmon and sea trout.

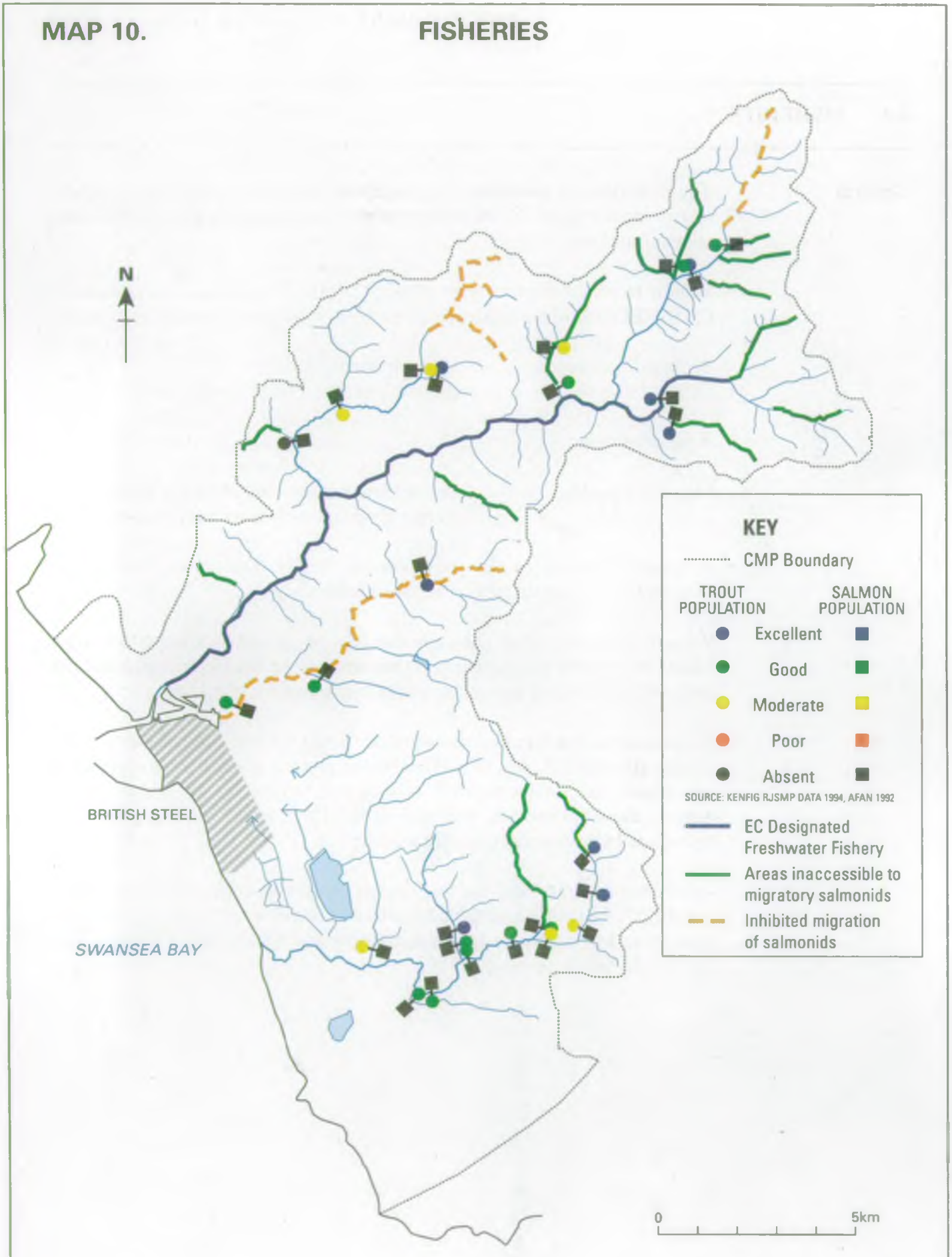
is largely protected by the provisions of the EC Dangerous Substances Directive which applies to all controlled waters.

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 yet receive the protection from similar formally quantifiable 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 the NRA employs 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).

MAP 10. FISHERIES



Local Perspective

Salmonid Fishery

The migratory salmonid fishery was virtually eliminated by the early 19th century as a result of the construction of Port Talbot Docks, which involved the diversion of the lower river and the installation of two major weirs in the lower reaches, and pollution particularly from coal mines and sewage discharges to the estuary. The recovery of the Afan during the last three decades has resulted from the alleviation of many of these problems, particularly the reduction in the height of Marcroft Weir, the decline in industry, and the construction of a fish pass on the Afan Docks Weir, initially by Afan Valley AA which was subsequently improved by the predecessor of the NRA.

Consequently the quality of salmon and sea trout fisheries in the Afan has improved dramatically since 1984 with anglers catching increasing numbers of both species. The continued vigilance of NRA bailiffs and the Afan Valley AA has greatly assisted in the protection of the fishery. Since 1986 a major increase in juvenile trout production has occurred, but fish are still absent from most of the Pelenna, which is significantly affected by minewater discharges and acidification.

Salmon populations in the Afan are increasing following a restocking programme by the predecessors of the NRA. No juvenile salmon have been detected at any of the routine sampling sites though juvenile salmon have been recorded during ad hoc surveys. There is therefore a need to review monitoring sites for juvenile salmon.

Early indications are that the 1994 salmon fishing season has been one of the best to date on the Afan which bodes well for future fish production.

The Ffrwd Wyllt, which prior to the creation of Port Talbot Docks was a tributary of the Afan, is predominantly a brown trout fishery although small numbers of sea trout are known to ascend the river from the docks in order to spawn. Their passage upstream is seriously impeded by a debris grid situated on the lower reach of the river and also by the Cemetery Weir a few hundred yards upstream.

The Kenfig is a predominantly brown trout fishery although sea trout enter the river when flows permit in the summer months. All of the sites sampled during routine monitoring have been of class C for juvenile trout or above but no juvenile salmon have been recorded in the Kenfig to date. Entry into the river is restricted by a weir in the lower river, which is required to facilitate abstraction by British Steel, and also the nature of the river channel as it flows across Margam Sands to the sea. The weir has been made passable during a limited range of flows by the installation of a fish pass by British Steel. Fish are further obstructed in Pyle where an old mill structure has been partially renovated in order to create a children's paddling area; unfortunately, the work was not completed and the passage of fish is seriously impeded.

Obstructions to the passage of migratory fish on the Afan, Ffrwd Wyllt and Kenfig, together with minewater problems and acidification, are likely to result in stocks being sub-optimal. Stepped weirs have been constructed at Corlanau on the Afan but man-made obstructions such as mine culverts still exist and present impassable barriers.

Despite the many changes that have occurred in the catchment, some relict stocks of wild native brown trout still exist above these natural impassable barriers and stocks need to be identified and protected, in accordance with the NRA Welsh Region's Brown Trout Strategy.

Several stillwater trout fisheries exist the largest of which is Eglwys Nunydd Reservoir. This water contains stocked rainbow trout and brown trout and both species are known to spawn successfully in the reservoirs feeder streams. Stocks are supplemented from a hatchery and rearing unit situated on the side of the reservoir and managed by the angling club. Other managed trout fisheries include Margam Park, Forest Lodge and Gerry's Lake.

Cyprinid Fishery

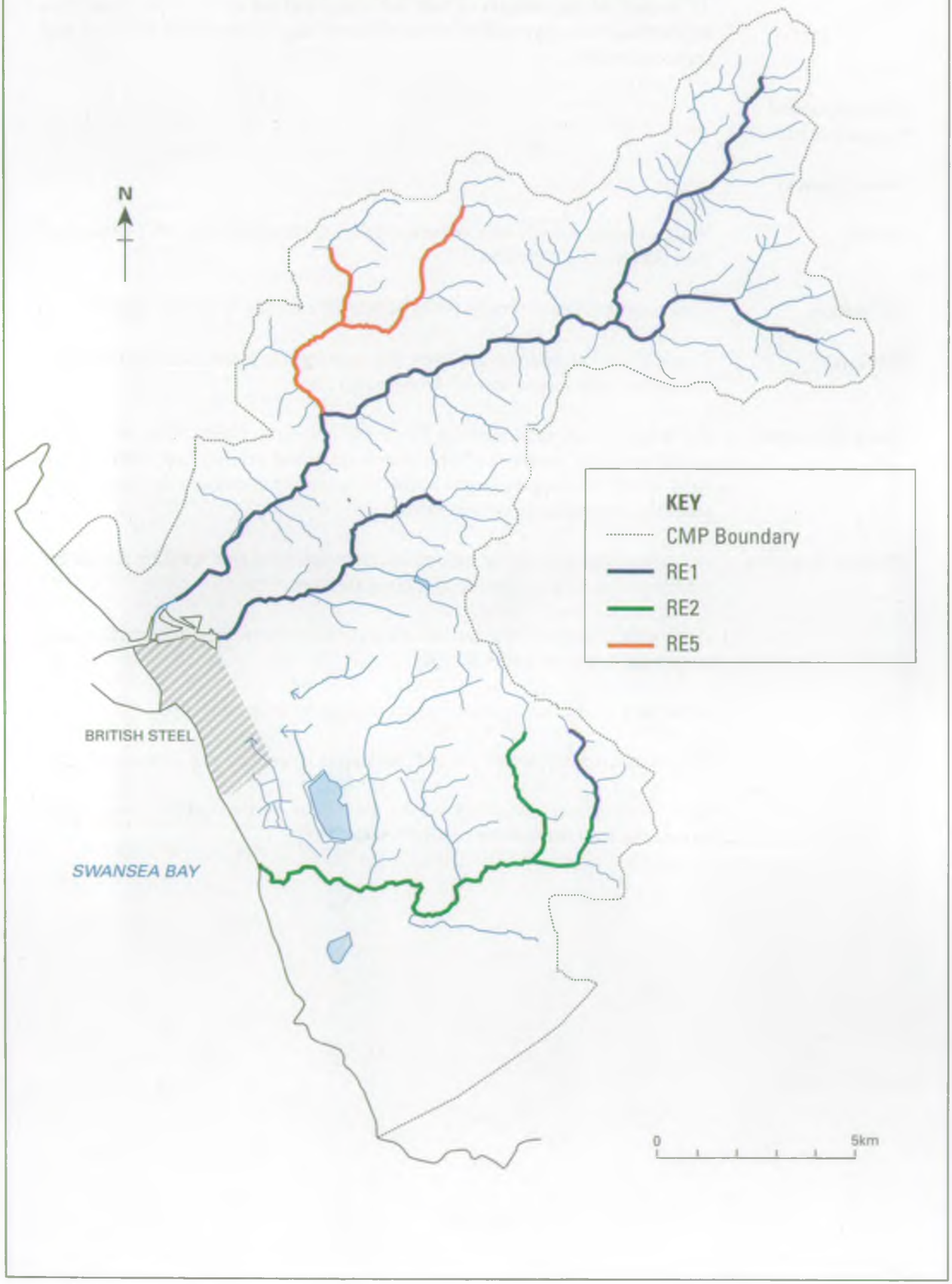
Although indigenous species such as minnows, bullheads and stoneloach are present in the rivers Afan and Ffrwd Wyllt there is no coarse fishery, as these rivers are far too flashy to support cyprinid species. The lower reaches of the Kenfig contain coarse fish which have been derived from the escape of fish from connected stillwaters, and also the reens present before the construction of the steelworks at Port Talbot.

Coarse fish ecosystems are therefore largely confined to still waters such as Margam Park Lakes, Kenfig Pool, Eglwys Nunydd Reservoir and Port Talbot Docks. These waters contain a variety of species including pike, rudd, tench, bream and carp.

Port Talbot Docks have developed in recent years into an unusual mixed fishery of rudd, perch, tench, gudgeon, pike, brown trout, sea trout and bass.

Aim	To sustain 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 of 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 identified for migratory fisheries element of the Fisheries Use.
Water Quantity	To develop and implement a Regional licensing policy that will, at a catchment level, enable the NRA to manage water resources to achieve the right balance between the needs of the environment and those of abstractors, including protection from derogation.
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 of 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.

MAP 11. CURRENT QUALITY AS DEFINED BY RIVER ECOSYSTEM (RE) STANDARDS



4.5 RIVER ECOSYSTEM

General

The River Ecosystem Use addresses the protection, maintenance and improvement of the basic water quality required to support different types of River Ecosystem. The Use has five classes with Class 1 being of the highest water quality. The details of the Use classes are defined in the "Surface Waters (River Ecosystem) (Classification) Regulation 1994". The Use applies to all watercourses in the catchment.

Within the classified stretches, the River Ecosystem Target Class will be used to replace the existing Long Term River Quality Objective (LTRQO) based upon the old National Water Council (NWC) system.

These targets represent the long term aspirations for the catchment and may not, in some instances, be achievable in the short-medium term. Consistent with this, the targets, set for this Use, for river stretches covered by this CMP will reflect what can be achieved within its intended life of 5-10 years.

As the River Ecosystem is the first Use introduced under the Water Quality Objectives scheme (See Section 5.1), it is hoped that these "interim" targets will be translated into Statutory Water Quality Objectives during the lifespan of this CMP. Once set as formal objectives the NRA will have a duty to ensure compliance with them.

Local Perspective

It is intended that the water quality of the catchment should be of very good quality, able to support a thriving salmonid fishery. Typically this would require the quality to be of RE Class 1 and as such the LTRQO for most of the catchment has been set at RE Class 1.

Currently the Afan and Ffrwd Wyllt are of RE Class 1 quality, with the exception of the entire Pelenna catchment which is RE Class 5 due to low pH. The quality of the Kenfig is currently of RE Class 2 with the exception of the most upstream stretch of the Nant Iorwerth Goch which is of RE Class 1 quality.

Aim

To provide water quality suitable to support a healthy River Ecosystem appropriate to the type of river.

Environmental Requirements

Water Quality

Waters should comply with the appropriate standards of Surface Waters (River Ecosystem) (Classification) Regulations 1994.

Water Quantity To develop and implement a Regional licensing policy that will, at a catchment level, enable the NRA to manage water resources to achieve the right balance between the needs of the environment and those of abstractors, including protection from derogation.

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

4.6 GENERAL ECOSYSTEM

General

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.

Thus this is the basic Use that 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. However, 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 suitably rigorous water quality targets will be applied.

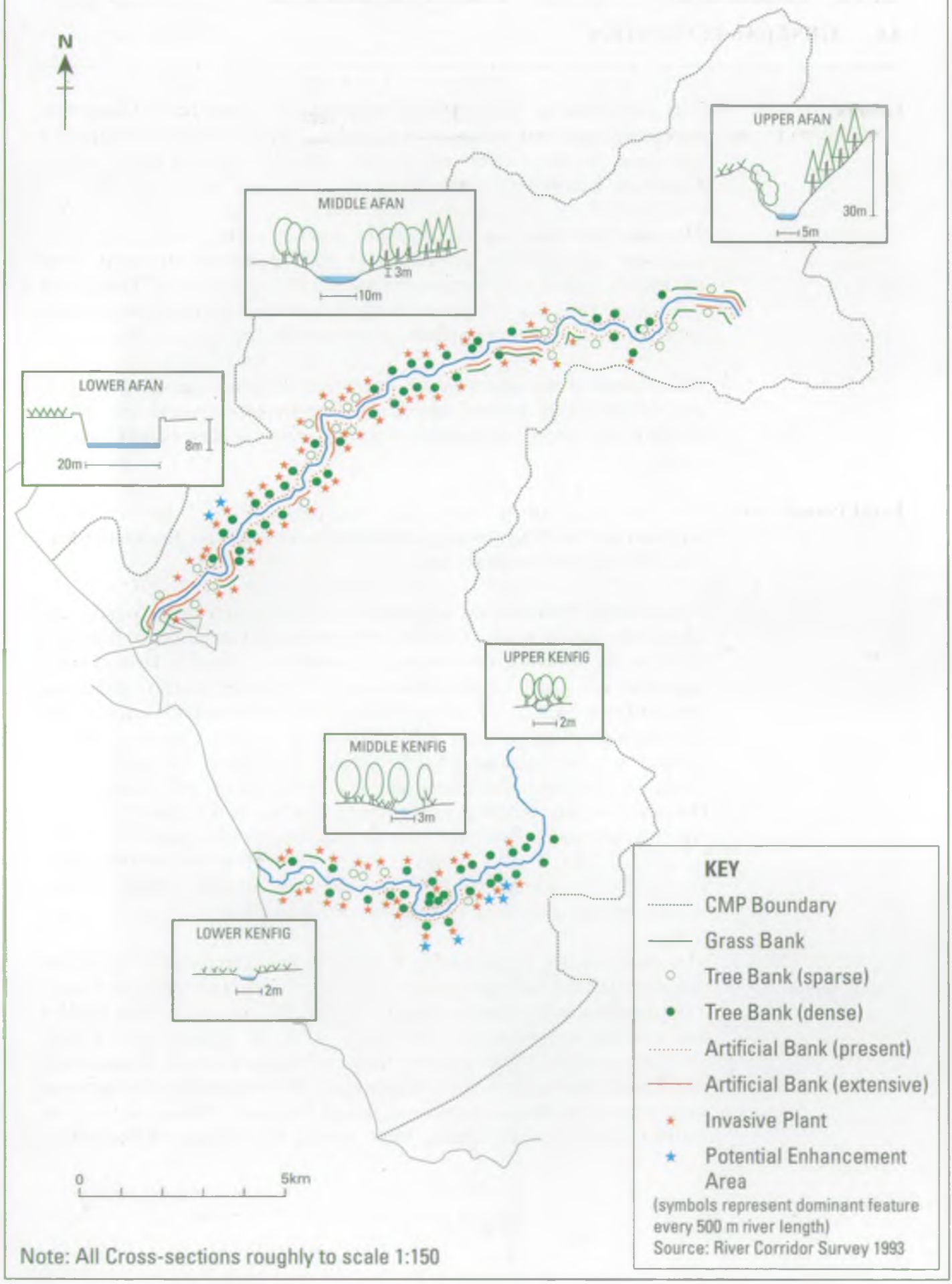
Local Perspective

The Afan and Kenfig rivers are two distinct, but relatively small, watercourses, the Afan reaching a maximum width of 20m, the Kenfig only 10m, both within the tidal reaches.

Flows within the Afan are dominated by riffles, with many rapids and occasional runs and pools. Cobbles and boulders are the principal river bed substrate with bedrock outcropping occasionally. There is little channel vegetation, as would be expected from such a mobile river system. Extensive lengths of river bank have been modified to control the natural course of the river through urbanised areas, although bankside trees (alder, ash, oak and willow) provide valuable wildlife habitat throughout the main river. Vegetation is especially sparse through Port Talbot and Abergwynfi. Dippers have been recorded in the middle reaches in abundance, but less welcome are mink which have been seen using drainage holes in concrete reinforced banks. Further threats to the natural ecology include fly-tipping and extensive conifer plantations within the river corridor. There are few wetland habitats associated with the Afan river corridor.

The lower reaches of the Kenfig, in contrast, are dominated by meanders with slow runs and slack water where there is an abundance of silt and sand. The upper reaches are characterised by riffle/pool sequences with cobbles and boulders dominating the river bed. Channel vegetation is sparse, although emergent plants (rushes, reeds and grasses) occur occasionally throughout. Alders grow in abundance along the river banks. Unimproved wetlands provide valuable habitats in several locations. Threats to the river corridor include localised tipping, stock grazing and drainage of wetlands.

MAP 12 RIVER CORRIDOR CONSERVATION



Note: All Cross-sections roughly to scale 1:150

The completion of a River Corridor Survey of the catchment has helped to identify those areas which require restoration or improvement (see Issue 19).

Invasive plants, such as Japanese Knotweed and Himalayan Balsam, are present throughout the middle and lower reaches of the Afan and the Kenfig, reducing bankside diversity and restricting native plants in localised areas.

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

To develop and implement a Regional licensing policy that will, at a catchment level, enable the NRA to manage water resources to achieve the right balance between the needs of the environment and those of abstractors, including protection from derogation.

Physical Features

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

4.8 CONSERVATION OF NATURE, LANDSCAPE AND HERITAGE

General

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.

The NRA has a duty to promote and further conservation of flora and fauna while it carries out its business. This includes the protection of water based or associated plants and animals that are so vital to the water environment. It also has 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 Areas of Outstanding Natural Beauty (AONBs), for which the NRA is an informal consultee, or as National Parks.

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 three main rivers within the plan area should have the capacity to sustain populations of otters, given their predominantly rural nature and improved water quality. Whilst there are no formal records of otters returning to these valleys, they are present in neighbouring catchments and it is believed that it is only a matter of time before they migrate into the catchment. The Afan and Kenfig are therefore classified as Priority Catchments in the Welsh Otter Conservation Strategy, requiring remedial work to facilitate the recovery of the species.

The lower end of the Afan and Ffrwd Wyllt and the mid reaches of the Kenfig are urbanised, whilst tracts of the industrial past are scattered throughout the catchment. The remainder of the area consists of beautiful scenery created by steep sided, heavily wooded valleys which provide spectacular seasonal variations in colour. There are large tracts of mixed woodland although the upper reaches of the river system are dominated by conifer plantations. It is hoped that Forest Design Plans, which are currently being refined by Forest Enterprise, will enhance the landscape value of the catchment.

Important wetland areas, including SSSIs mentioned in Section 4.7, include the excavated pools adjacent to the Kenfig estuary, which are rich in aquatic flora.

Within the catchment there are over 25 ancient monuments listed by Cadw, though most of these are ancient fortifications or burial chambers not directly associated with aquatic environments.

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 at least conform with the informal standards for Aesthetic Standards criteria.

Where water quality is a key factor, it should comply with the appropriate River Ecosystem class, while estuarial and coastal waters should conform with standards for the Protection of Sensitive Aquatic Life.

Water Quantity

To develop and implement a Regional licensing policy that will, at a catchment level, enable the NRA to manage water resources to achieve the right balance between the needs of the environment and those of abstractors, including protection from derogation.

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.

4.9 ABSTRACTION

General

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 the NRA 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). Also, large areas of North and West Wales are exempted from the licensing requirement 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. The requirement for an abstraction licence is shown in Appendix 1b.

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 the NRA and its predecessors to restrict pre-existing abstractions.

In considering applications for new licences, the NRA must ensure that there is no derogation of existing abstractors without their agreement, and that the aquatic environment and associated habitats are properly safeguarded. The NRA does 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.

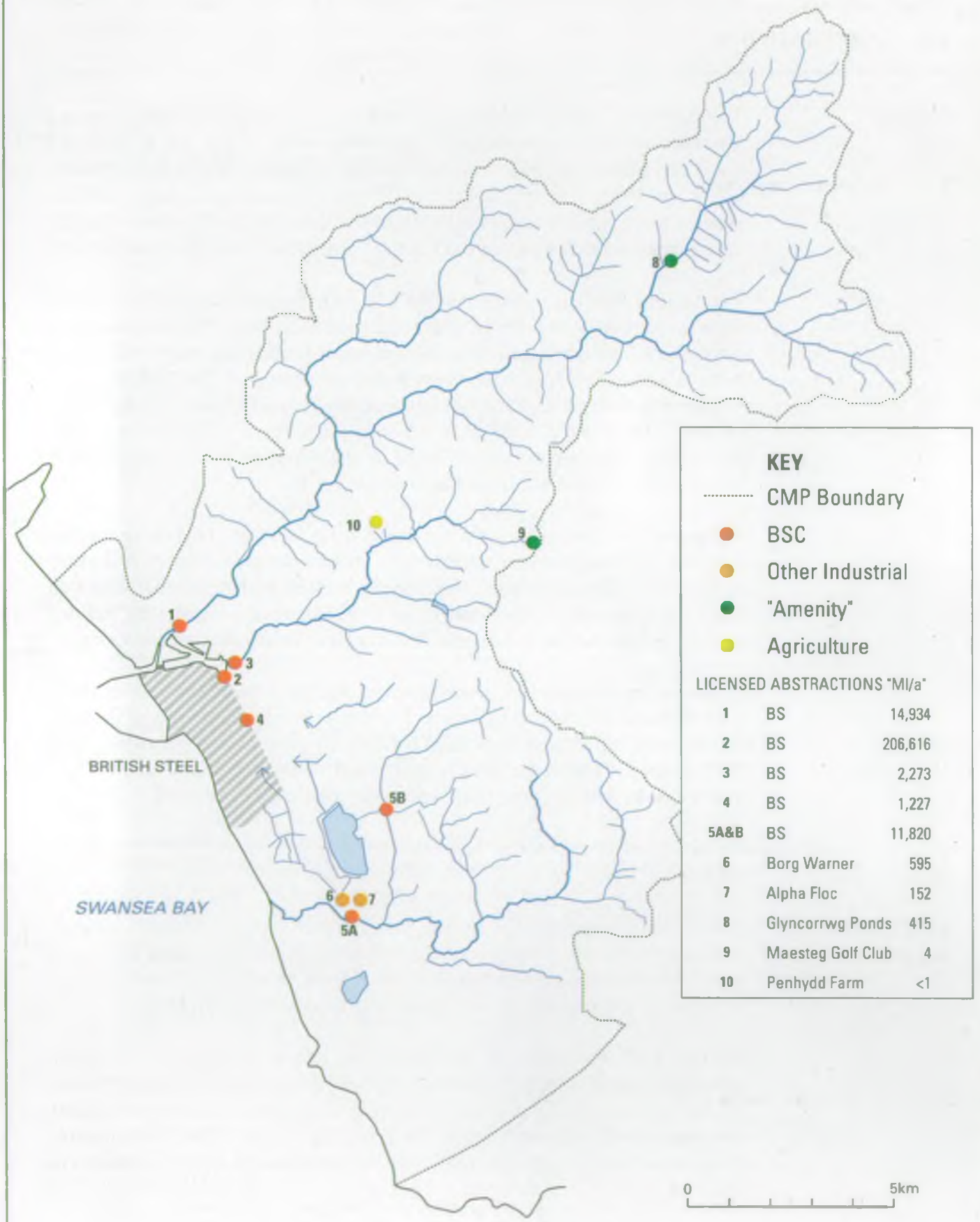
Certain types of abstraction have specific issues associated with them, as follows:

Public Water Supply

Public water supplies are mainly taken from surface waters - rivers, streams and reservoirs - but groundwater sources can be important on a local scale. Private supplies are generally derived from springs and boreholes and their quality is monitored by the Local Environmental Health Officer.

The NRA is not responsible for the quality of the raw water, nor of the delivered, treated water. However, it does have a duty to protect water quality and will specify protection zones around groundwater sources that seek to control certain potentially polluting activities. The Groundwater Protection Policy (Appendix 1a) forms the basis for the NRA's activities in this area.

MAP 14. LICENSED ABSTRACTIONS



KEY

- CMP Boundary
- BSC
- Other Industrial
- "Amenity"
- Agriculture

LICENSED ABSTRACTIONS "Ml/a"

1	BS	14,934
2	BS	206,616
3	BS	2,273
4	BS	1,227
5A&B	BS	11,820
6	Borg Warner	595
7	Alpha Floc	152
8	Glyncorrwg Ponds	415
9	Maesteg Golf Club	4
10	Penhydd Farm	<1

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 nett 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.

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. The NRA 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 the normal NRA authorisation procedures.

Local Perspective

Public

The local water supply undertaker, Dŵr Cymru, have no licensed abstractions within the Afan and Kenfig catchment area, although there is a disused reservoir at Cwm Wernderi which contains water that is acidic in quality. As a result all water supplied to customers in the catchment is imported from elsewhere. The catchment north of a line running approximately east-west through Cwmafan is supplied with water from Ystradfellte Water Treatment Works (WTW) which is in the upper Neath catchment. The area south of this line is served by Felindre WTW which, in turn, is supplied by water from the Lliw and Tywi catchments.

Industrial

The dominant industrial abstractor in the area is British Steel at Port Talbot who hold five abstraction licences for the site. These are all Licences of Right and, as such, generally have no restrictive conditions other than a maximum daily rate. The exception is the licence covering the abstractions from the Castle Stream and Kenfig, for which there is an agreed residual flow of 2.273 Ml/d on the Castle Stream. The total authorised abstraction for which British Steel is licensed is 236,870 Ml/a.

Eglwys Nunydd Reservoir is used as a balancing reservoir for abstracted and recirculated water used in industrial processes at British Steel.

The other industrial abstractors in the catchment are Borg Warner and Alpha Floc who between them are licensed to abstract 747 Ml/a from wells on the Kenfig Industrial Estate. Any additional demand for industrial water in the catchment is met by the potable supply from Dŵr Cymru, the local water undertaker.

Water Transfer

Abstraction of water by a Navigation Authority (as defined in the Water Resources Act 1991), for the purposes of its functions as such an authority, is exempted from licensing. However, abstractions from a waterway managed by a Navigation Authority are subsequently subject to licensing requirements. There is a transfer of water from the Afan into Port Talbot Docks via a feeder channel. This is facilitated by the Afan Docks Weir across the river. The purpose of this feeder is to maintain levels in the dock basin but it also provides water for British Steel who abstract water both direct from the feeder and from the docks.

Amenity

There is an abstraction licence for 415 Ml/a to provide a flow through a series of ponds constructed on the Afan Corrwg. The majority of this water is returned to the river but, in order to safeguard the reaches between the ponds inlets and outlets, there is a condition on the licence requiring abstraction to cease when flows, as measured at the NRA's gauging station on the Afan at Marcroft Weir, fall to a predetermined level.

Maesteg Golf Club abstracts water from a borehole near the source of the Nant Cwm Farteg for irrigating the tees and greens and supplying the clubhouse. The licence is for 4.32 Ml/a.

Agriculture

There is only one licensed agricultural abstraction in the entire area, this being a Licence of Right for a modest 0.002 Ml/d. This reflects the relatively low level of agricultural activity in the area.

Aims

To manage the quality and volume of water resources 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 as possible and discharges to be made as close to the point of abstraction as is practicable.

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

Agricultural/Spray Irrigation

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

Environmental Requirements

To develop and implement a Regional Licensing Policy that will, at a catchment level, enable the NRA to manage water resources to achieve the right balance between the needs of the environment and those of abstractors, including the protection from derogation.

4.10 SEWAGE EFFLUENT DISPOSAL

General

In Wales most sewage effluent discharged into freshwaters has 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 very high. All these types of discharge are regulated by the NRA which issues, and monitors compliance with, consents to discharge. 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 Dŵr Cymru handles the bulk of sewage effluent discharged to freshwaters, although the greater number of STWs are privately owned.

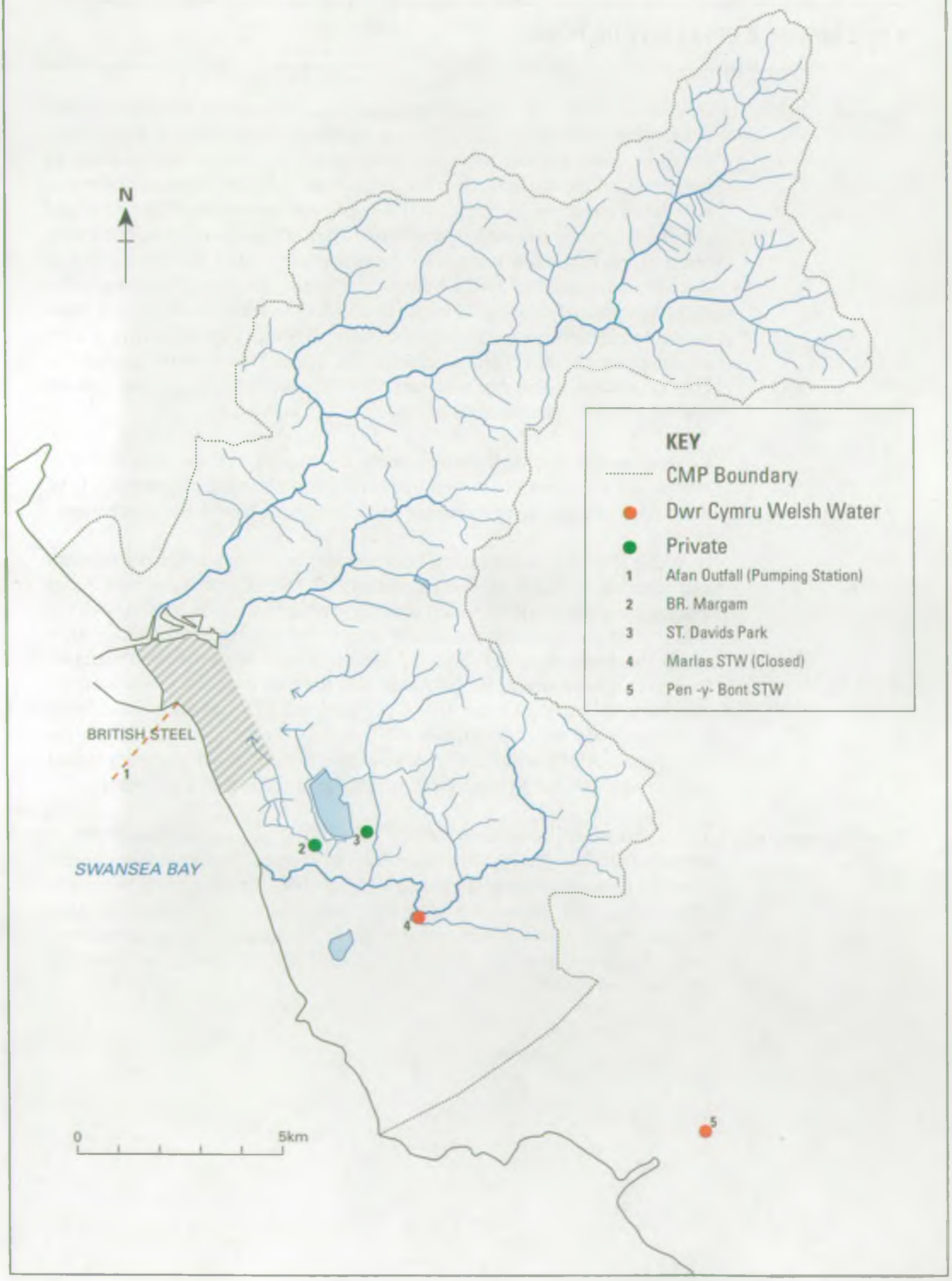
Coastal sewage discharges which serve the majority of the population of Wales, are also generally owned by Dŵr Cymru although at present few of them receive the level of treatment associated with freshwater discharges.

In Welsh Region, the continuing improvement in sewage effluent treatment and disposal facilities will be the subject of Dŵr Cymru's second Asset Management Plan (AMP2), which is being produced in close liaison with the NRA. This plan specifies the capital investment required for Dŵr Cymru's assets (with regard to the terms of the EC Urban Wastewater Treatment Directive). Consequently, the NRA has, over the past two years, assessed the environmental impact of every Dŵr Cymru owned STW discharge and those from combined sewer overflows (CSOs) in order to provide a basis for establishing AMP2 priorities. Any sewage effluent related issues identified within this CMP will be considered within the agreed AMP2 programme.

Local Perspective

The majority of sewage collection and disposal in the catchment is undertaken by Dŵr Cymru. The main point of sewage treatment and effluent disposal is the Afan Pumping Station and outfall. Sewage from the entire Afan Valley, Port Talbot, Margam and Pyle areas is collected at the Afan Pumping Station via a series of gravity sewers and satellite pumping stations. At the Pumping Station the sewage is screened prior to discharge through a 3km long sea outfall.

MAP 15. SEWAGE EFFLUENT DISPOSAL



The disposal location has been identified as a High Natural Dispersion Area. This is an area where the effects of dilution by the sea and currents ensures that the effluent should not have any adverse environmental impact. Future proposals for this site include the provision of at least primary settlement in line with the requirements of the EC Urban Waste Water Treatment Directive. Dŵr Cymru will be required to undertake studies to confirm that this level of treatment will be sufficient for achievement of all appropriate environmental quality standards. If this cannot be demonstrated then further treatment will be required. It should nevertheless be noted that Dŵr Cymru has long term plans to provide a minimum of secondary treatment for all coastal sewage discharges.

Recent improvements in water quality of the Kenfig downstream of Pyle have taken place following the closure of Marlas sewage treatment works (STW) in 1992. The STW was replaced with a pumping station that pumps sewage from the area to the Afan Pumping Station.

Sewage effluent from the area of Porthcawl which falls within the catchment is also the responsibility of Dŵr Cymru. The sewage is pumped to Penybont STW, where it receives full secondary biological treatment by an activated sludge process before discharging to the Ogmore Estuary.

A number of CSOs in the Afan catchment have historically caused water quality problems, between Pontrhydyfen and Port Talbot. Recent sewer improvement works in the area have, however, greatly improved this situation. In the Kenfig catchment, the CSO at Bedford Road, Kenfig Hill, has a significant impact on the Nant Iorwerth Goch. Until the sewerage system in this area can be improved, it may be necessary to restrict further significant development.

There is one existing small non-Dŵr Cymru STW in the Kenfig catchment, the British Rail Margam Depot which discharges secondary treated effluent to local watercourses. A further STW, proposed at St. David's Park Housing Development, is planned to discharge secondary treated effluent to land.

Aim

To control the disposal of treated and untreated sewage effluent and sewage sludge in a way that protects other water uses.

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

No deterioration in the quality of water above discharges, beyond that assumed when setting the consent for an authorised discharge.

No deterioration in water quality, below the area of mixing for the discharge, which causes detriment to other uses.

Water Quantity

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

To develop and implement a Regional licensing policy that will, at a catchment level, enable the NRA to manage water resources to achieve the right balance between the needs of the environment and those of abstractors, including protection from derogation.

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.

4.11 INDUSTRIAL EFFLUENT DISPOSAL

General

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.

At most sites the NRA controls pollution from industrial effluents by a system of consents to discharge. 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 the NRA will seek to ensure that any authorization 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 NRA pollution prevention policy.

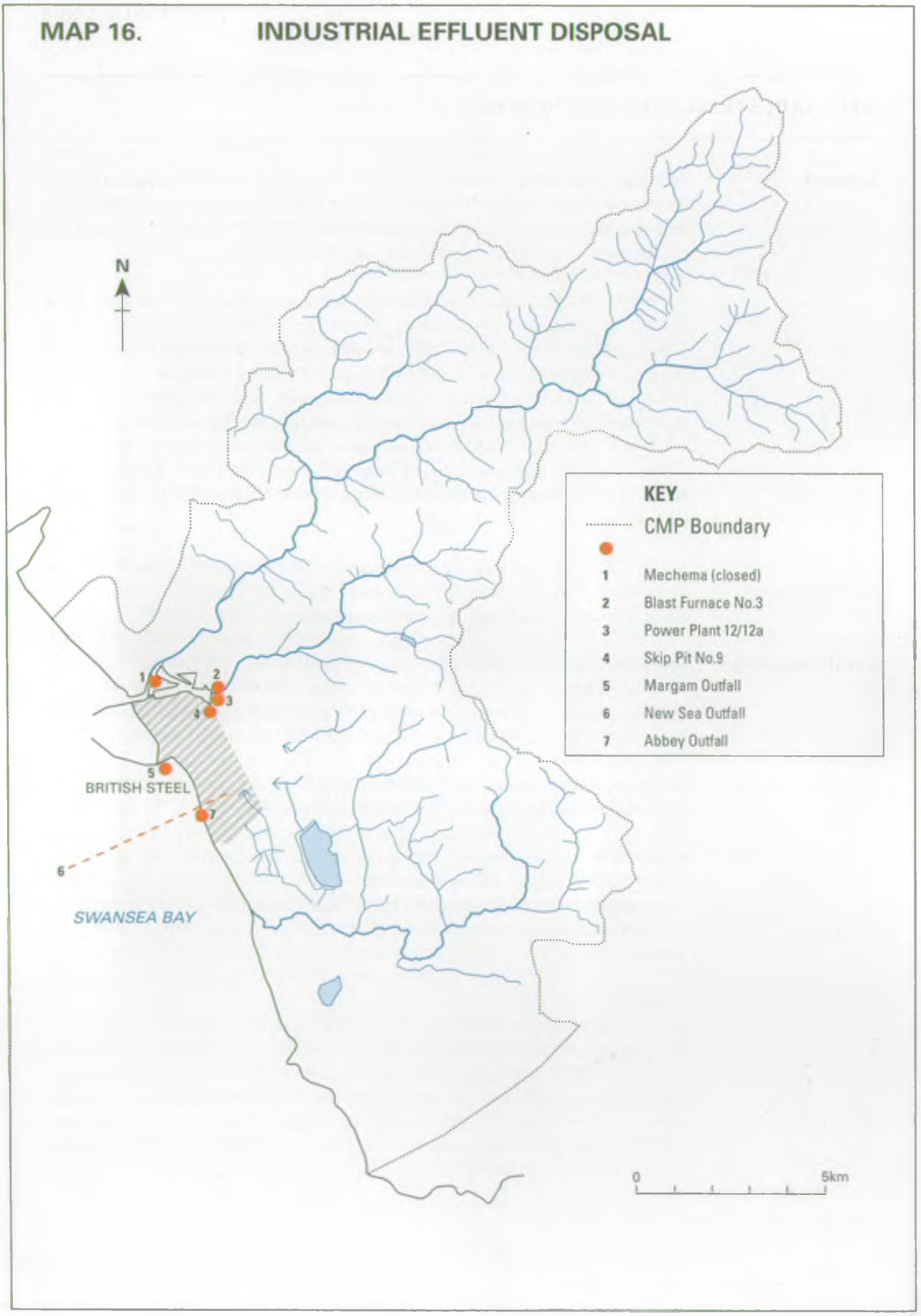
Trade effluent is discharged to sewers with the permission of the sewerage undertaker (Dŵr Cymru in Welsh Region) and is then subject to the sewage effluent treatment and disposal controls outlined in Section 4.10.

Local Perspective

The main industrial effluent discharges emanate from the British Steel site. There are a total of six discharges from the site with NRA consents, the most significant being the New Sea Outfall. This can discharge up to 70,000 m^3/d via a 3km long sea outfall. The discharge may consist of treated effluent from a number of processes and site run-off. The consent includes limits for ammonia, metals, polyaromatic hydrocarbons, particulate solids and oils. Two smaller discharges occur at the Margam and Abbey outfalls and mainly consist of site surface water run-off and emergency overflows from a variety of processes on site. These are consented to discharge limited concentrations of particulate solids, oils and greases at volumes dependent on rainfall. Although a number of the process and effluent discharges on site are subject to HMIP authorisations, the ultimate discharges to the water environment are controlled by the NRA. HMIP will authorise the remainder of the site during 1995.

Occasional failures to meet discharge consent standards have been recorded for these discharges and British Steel, HMIP and the NRA are in consultation over plans to improve performance. Preliminary discussions have taken place on the abandonment of the Margam and Abbey discharges to leave the New Sea Outfall as the only discharge point. Planned new treatment facilities prior to discharge should achieve a consistently better effluent quality, within consents limits.

MAP 16. INDUSTRIAL EFFLUENT DISPOSAL



There are other minor discharges from the site which consist of cooling water and site run-off to the Port Talbot Dock complex.

Historically, the Mechema site at Port Talbot Docks discharged an effluent containing ammonia and metals to the Afan Estuary. This discharge had a considerable impact on the estuary and negotiations to improve the situation were ongoing with the NRA. However, the factory closed in 1992 and the main discharge ceased. Since contaminated land at the site was encapsulated, the volume and concentration of the discharge has further diminished and no longer has an impact on the estuary.

Aims

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

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 deterioration in water quality above the discharge below that assumed when the discharge consent was calculated.

Water Quantity

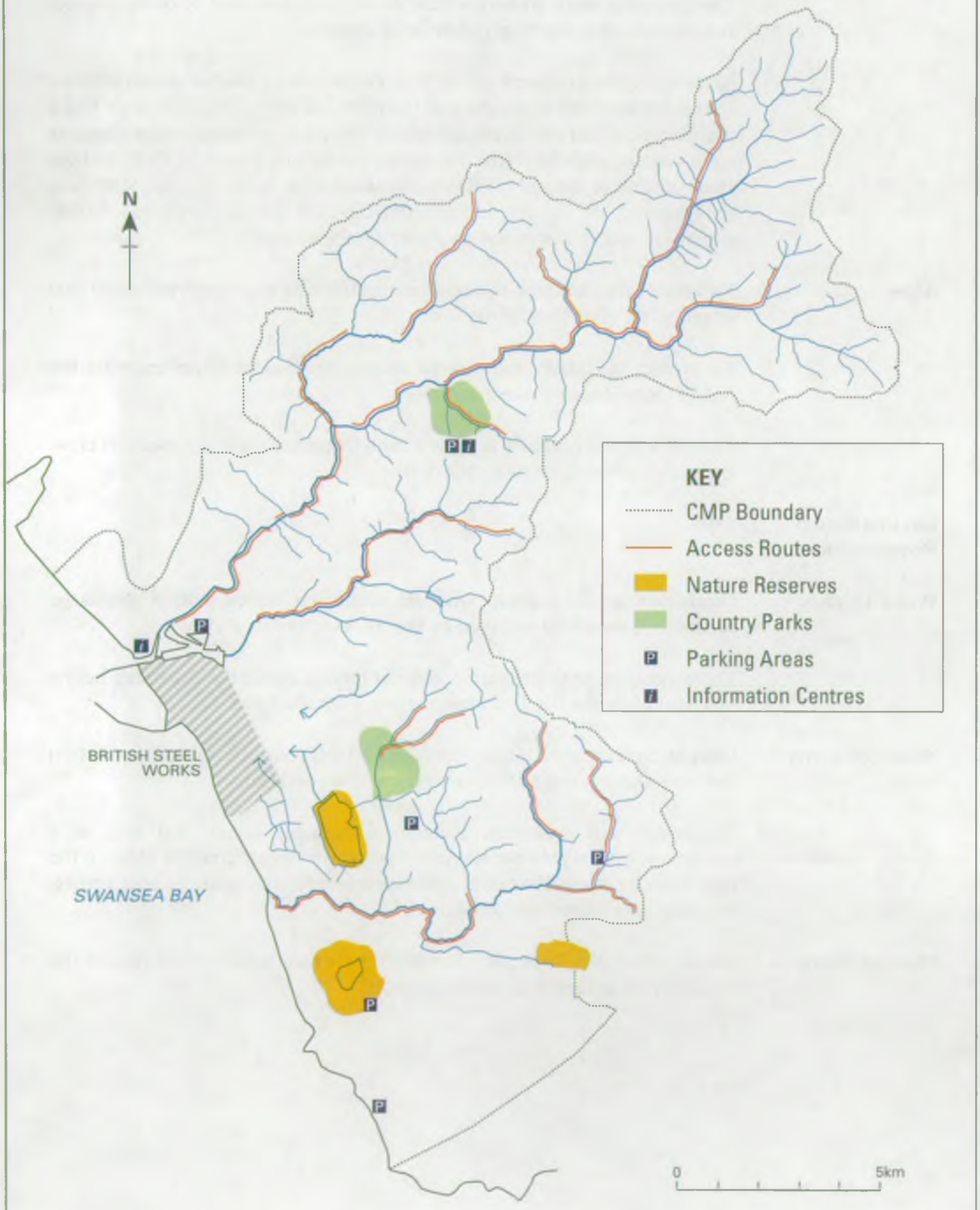
Consent conditions will be derived taking into account the upstream dilution available under average and dry weather flow conditions.

To develop and implement a Regional licensing policy that will, at a catchment level, enable the NRA to manage water resources to achieve the right balance between the needs of the environment and those of abstractors, including protection from derogation.

Physical Features

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

MAP 17. BASIC AMENITY



4.12 BASIC AMENITY

General

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

Given the scenic beauty and the extensive footpath networks throughout the area, there are large numbers of visitors including ramblers, birdwatchers, pony-trekkers and conservationists.

The Afan Valley has a high quality cyclepath along its length with access from Glyncorrwg to Port Talbot with few road crossings and is very popular.

Two country parks at Margam and Afan Argoed provide facilities for visitors. A further amenity in the form of three lakes exists at Glyncorrwg in the north of the Afan catchment.

Aims

To maintain the watercourse so that the public enjoyment of bankside environment is not impaired.

To provide safe and easy access to the waterside without unreasonably constraining other Uses.

Environmental Requirements

Water Quality

Water quality should comply with the targets for Aesthetic Criteria which effectively define the minimum water quality acceptable for any water body.

Water Quantity

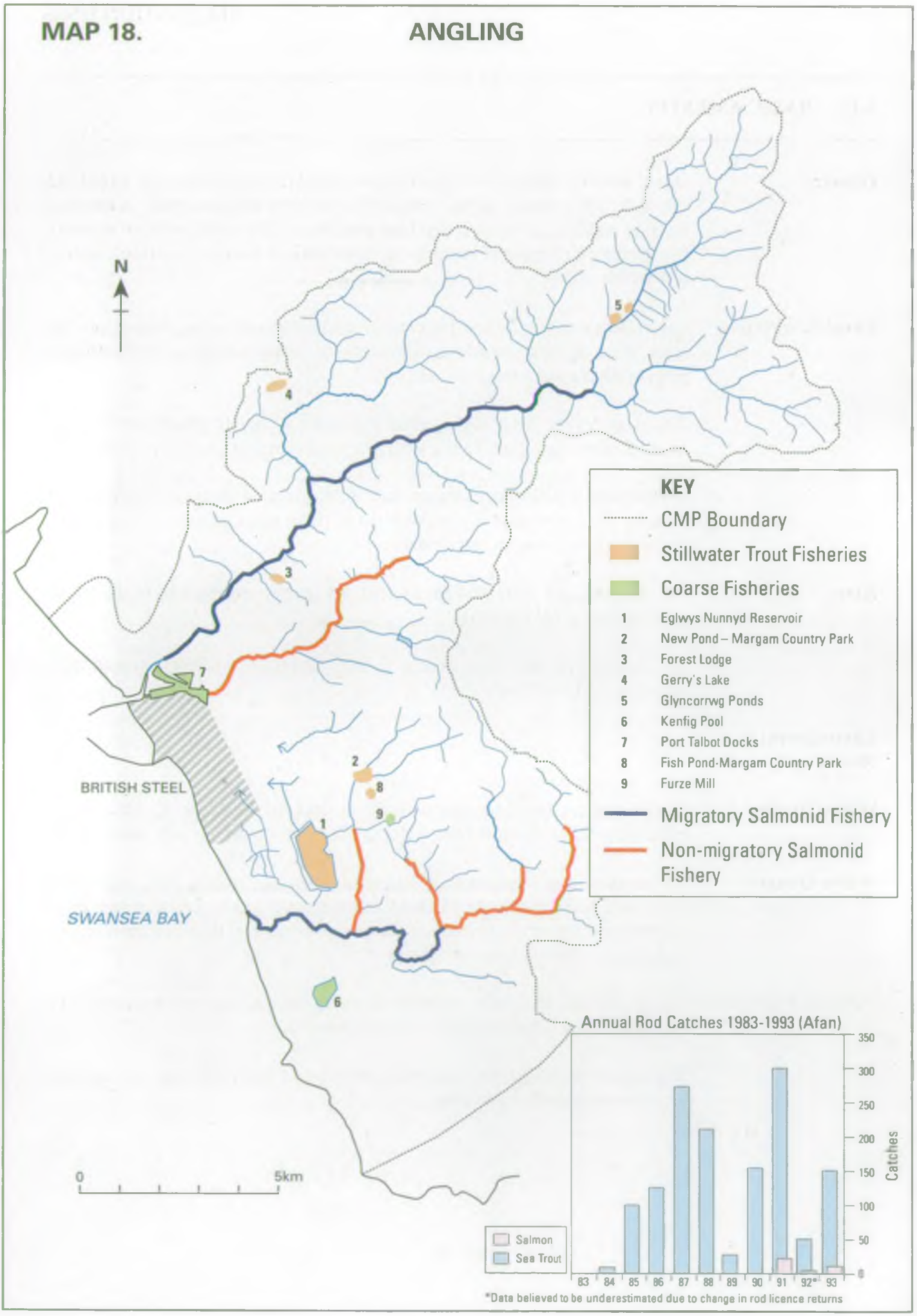
To develop and implement a Regional licensing policy that will, at a catchment level, enable the NRA to manage water resources to achieve the right balance between the needs of the environment and those of abstractors, including protection from derogation.

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.

MAP 18. ANGLING



4.13 ANGLING

General

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 the NRA has formal responsibility towards angling, and issues 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, the NRA has neither control of, nor responsibility for, sea angling and it is not covered specifically in CMPs.

Local Perspective

Angling on the Afan and Ffrwd Wyllt is controlled by the Afan Valley Angling Association and membership is restricted to members of the local community. The Association has been in existence for many years and has played a major role in the recovery and the management of the river fishery. In particular the Association has been involved in assisting with clean-up operations, bankside planting, restocking with brown trout and, with assistance from the NRA, the construction of disabled anglers platforms.

Fishing effort on the Afan is aimed at brown trout in the early season (Mar-May) and sea trout and salmon during the summer and autumn months.

Whilst the Association owns the fishing rights throughout most of the Afan catchment, it only permits fishing on the main Afan, protecting the tributaries as fish nursery areas.

Angling on the Kenfig is controlled by the Kenfig Hill and District Angling Association which leases the fishing rights for Kenfig Pool. The river is stocked with brown trout annually. Kenfig Pool is renowned for large pike, tench and rudd and in the past has held the Welsh record for these species.

Eglwys Nunydd reservoir is owned by British Steel and a section of their sports club controls fishing there. The club are particularly keen on rearing their own fish in a purpose built hatchery unit adjacent to the reservoir and they can now lay claim to one of the country's top rainbow trout fisheries. At present, coarse fishing is not permitted on the reservoir.

Other fisheries frequented by anglers include the day ticket lakes at Margam Park which are mixed coarse and trout fisheries and also Gerry's Lake at Pontrhydyfen and Forest Lodge, both of which are trout only waters. Port Talbot Docks provide an important local amenity for those living in the vicinity and its reputation is such that people travel from Swansea and Cardiff to fish there for coarse fish, brown trout, sea trout and bass.

Aim

To ensure that the water environment can sustain angling at least at its current distribution and quality.

Environmental Requirements

Water Quality

The standards relating to Aesthetic Criteria should be maintained so that the enjoyment of the waterside is not diminished. Fish stocks are protected by the provision of the Fisheries and River Ecosystem Uses.

Water Quantity

To develop and implement a Regional licensing policy that will, at a catchment level, enable the NRA to manage water resources to achieve the right balance between the needs of the environment and those of abstractors, including protection from derogation.

Physical Features

Safe access to and from the waterside should be promoted.

The waterside features required for angling should be maintained and developed.

4.14 WATER SPORTS ACTIVITY

General

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.

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.

Identified Bathing Waters

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, life guards and toilets. Identified waters are required to achieve the mandatory total and faecal coliform standards of 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.

Water Contact/ Recreational Use Waters

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 the NRA does not recommend bathing in freshwaters.

Local Perspective

Much of the coastline is inaccessible due to the Port Talbot steelworks and coastal water sports activity is thus largely limited to the Porthcawl area and Aberavon Sands, although Margam Sands is occasionally frequented. In Porthcawl, the beach at Rest Bay is popular with surfers and jet-skiers. Port Talbot Docks are also used for jet-skiing.

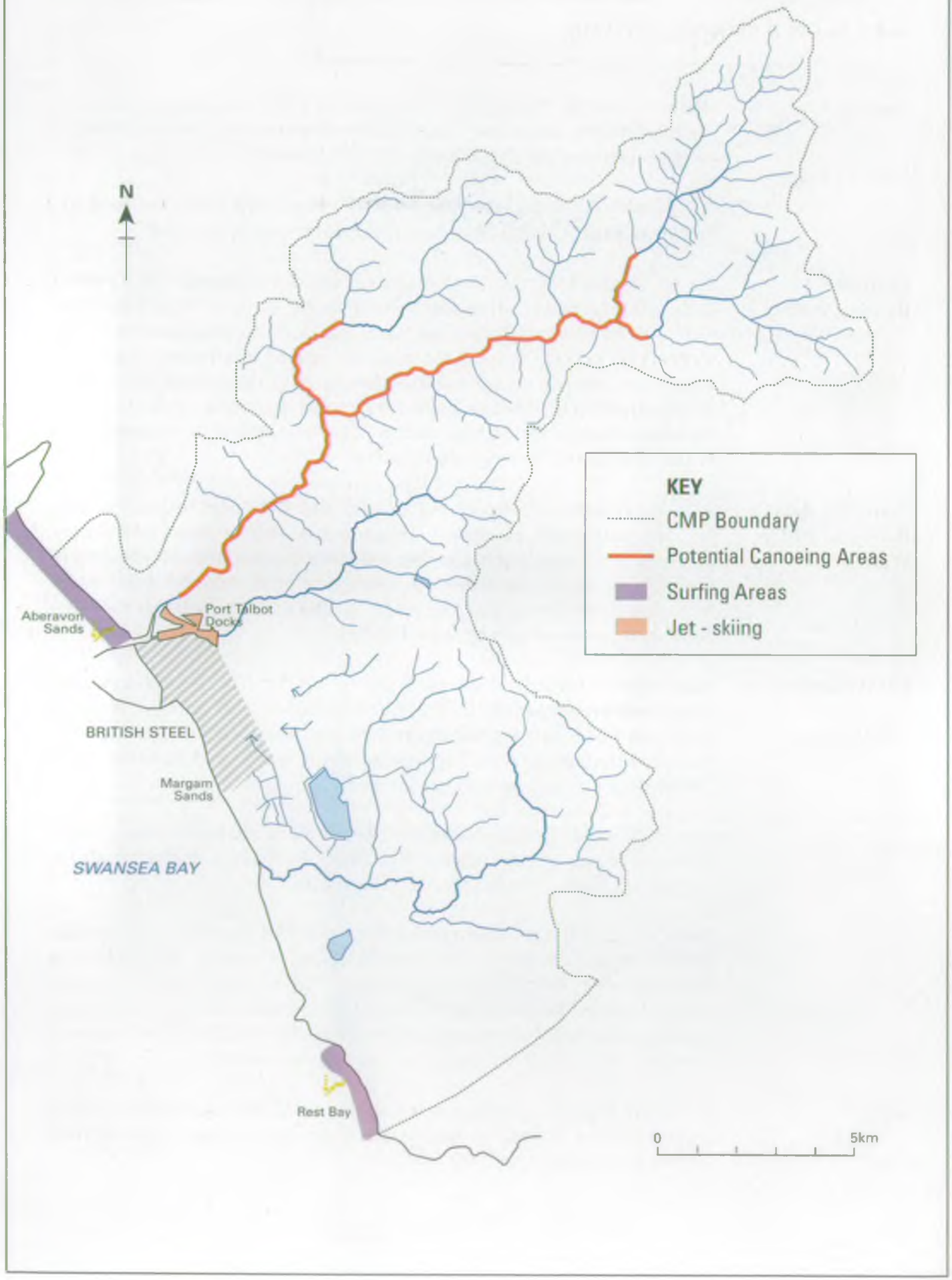
Two EC Identified Bathing Waters are present along the coastal strip, one at Aberavon Sands and the other at Rest Bay. Both are compliant with the relevant EC Bathing Waters Directive standards.

There is no public right of navigation above the tidal limit and only the Afan could be deemed suitable for general canoeing use. However, the controlling fishing interests do not permit canoeing at any time and this does cause conflict between themselves and trespassing canoeists. Statutory legislation regarding disturbance of spawning areas will restrict availability of waters to canoeists should access agreements eventually be reached.

Aim

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.

MAP 19. WATER SPORTS ACTIVITY



Environmental Requirements

Bathing in Identified Waters:

Water Quality At Identified Bathing Waters (EC Directive), water quality should conform with the mandatory total and faecal coliform standards contained within the EC Bathing Waters and the mandatory standards in the EC Dangerous Substances Directives and should meet the appropriate standards for Aesthetic Criteria.

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

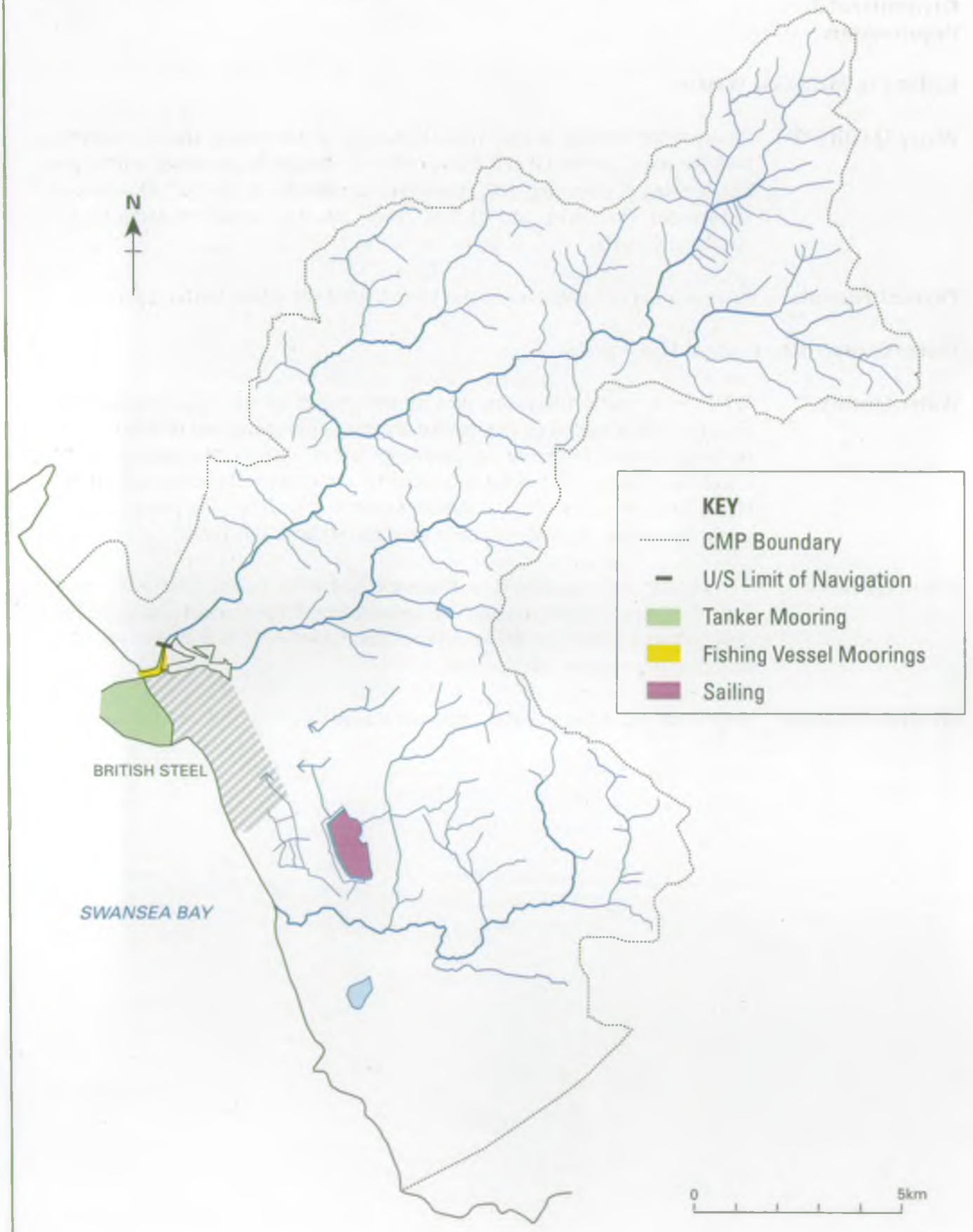
Water Contact/Recreational Use Waters:

Water Quality Where such marine waters are used for immersion sports, including bathing, the NRA will be guided by the mandatory standards contained within the EC Bathing Waters Directive in assessing water quality requirements for Catchment Plans. The NRA is unable to set bacteriological standards in CMPs for freshwaters where immersion sports or bathing take place but will apply the general Aesthetic Criteria used throughout this report.

Water Quantity To develop and implement a Regional licensing policy that will, at a catchment level, enable the NRA to manage water resources to achieve the right balance between the needs of the environment and those of abstractors, including protection from derogation.

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

MAP 20. NAVIGATION AND BOATING



4.15 NAVIGATION AND BOATING

General

Navigation is considered to be the use of pleasure and commercial craft in waters that fall under the general control of the NRA 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 the NRA. However, in the Dee estuary the NRA is the navigation authority. Elsewhere in tidal waters the NRA neither has control over nor responsibility for navigation.

While the NRA is not the navigation authority for either of the two freshwater rights of navigation that exist in Wales it may under certain circumstances introduce byelaws to control navigational use of a river. The NRA 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 the NRAs concern is principally for the participants' enjoyment of the activity.

Local Perspective

There is no public right of navigation upstream of the tidal limit on any of the rivers, and access is restricted by the presence of major in-river obstacles.

A large sailing club operates at Eglwys Nunydd and pleasure boats of all types are used in coastal waters.

A number of commercial fishing vessels use the sheltered Afan estuary for moorings with access being restricted by tides. Port Talbot docks, which used to be active, have now been sealed and boats are unable to pass to and from the sea.

Large vessels carrying coal, iron ore and oil berth at the British Steel breakwaters where their contents are unloaded. The approaches to the deep water harbour are kept clear by dredging by Associated British Ports. The spoil is deposited at a spoil ground in Swansea Bay, under licence by MAFF. A small slipway in the vicinity of the breakwaters is utilised by small craft, used by sea anglers.

Aims

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

To encourage and support canoe access agreements on the rivers Afan and Kenfig.

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

Environmental Requirements

Water Quality

The provisions for Aesthetic Criteria should be complied with.

Water Quantity

To develop and implement a Regional licensing policy that will, at a catchment level, enable the NRA to manage water resources to achieve the right balance between the needs of the environment and those of abstractors, including protection from derogation.

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.

4.16 AGRICULTURAL ACTIVITY

General

The processes and by-products of agriculture are a major potential threat to the water environment, especially in more intensively cultivated areas. Key areas of concern to the NRA 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;

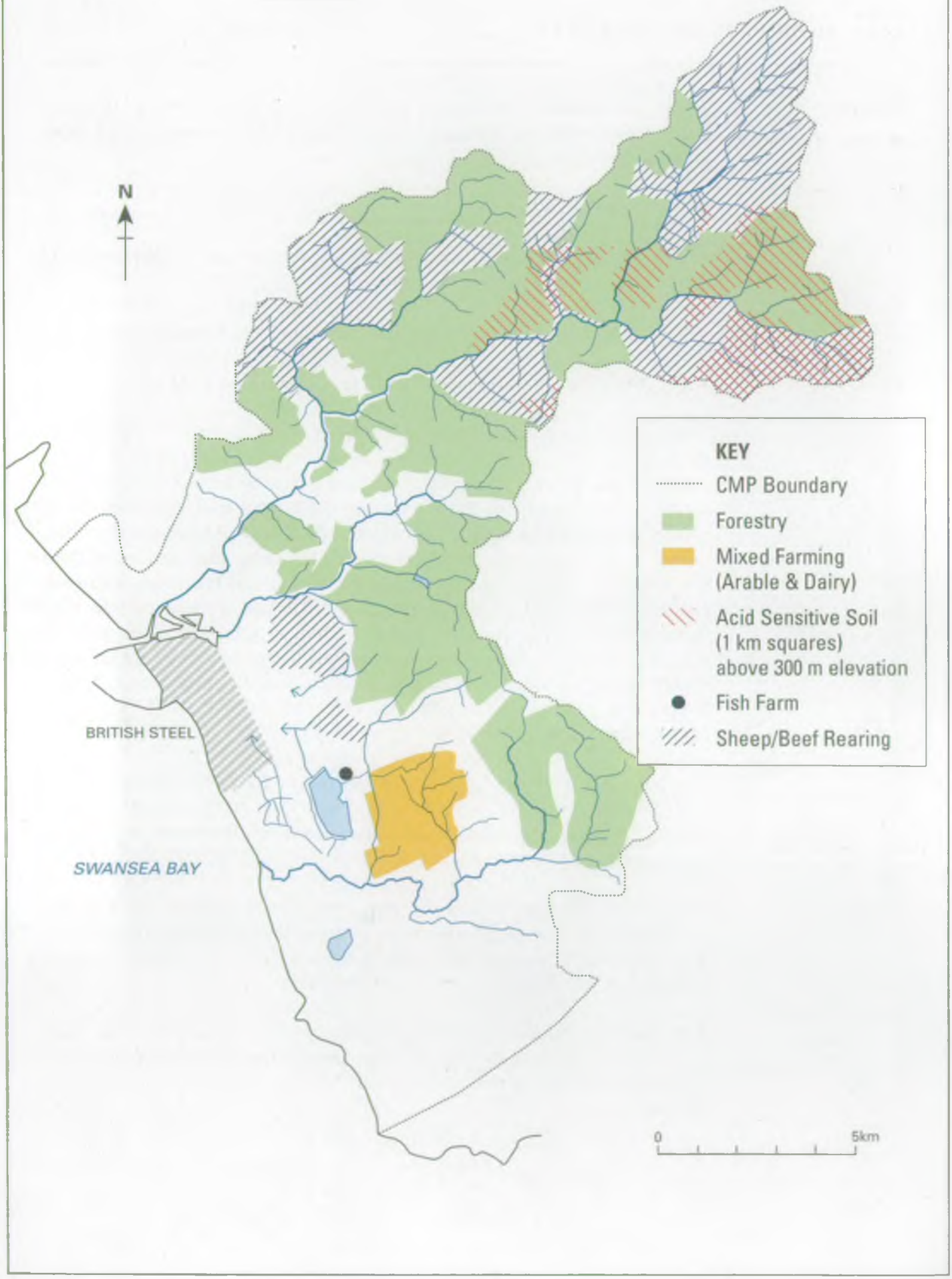
Where there is a specific discharge of effluent from a farm site this will be dealt with via the general discharge consenting process described in the discharge uses sections. However, the highly polluting nature of agricultural waste normally precludes this option and the NRA's approach is aimed at 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 the NRA. Consequently the NRA has 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 a programme of farm visits by NRA staff helps to alert farmers to potential and existing problems.

The NRA issues 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.

The NRA encourages farmers 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 the river reduced in flow. The requirement for an adequate residual flow can restrict the viability of a fish farm.

MAP 21. AGRICULTURE AND FORESTRY



Local Perspective

Agricultural activity is at a relatively low level due to the dominance of forestry, industrial and urban developments in both catchments. In the Afan catchment, agriculture that exists is limited to small scale sheep and beef operations in the upland areas. These tend to present few pollution problems.

The upper Kenfig catchment is broadly similar. However, the flatter lowland area between Margam and Pyle supports a wider variety of operations. These include a number of dairy units, arable farming and the traditional sheep and beef seen in other parts of the catchment. Problems due to agricultural effluent have been identified and these are now being addressed. Agricultural land in this area is under threat from development, including housing and golf courses.

Some exploitation of the deer stocks takes place in the Margam Country Park. A fish rearing unit adjacent to Eglwys Nunydd reservoir, run by a section of the British Steel sports club, supplies the excellent rainbow trout fishery that exists in the reservoir.

Aims

To protect the water environment from the potential adverse effects of agricultural activity.

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

Environmental Requirements

Water Quality

All consented discharges should comply with the conditions expressed in the consent. This will be enforced by the NRA.

The codes of practice for the handling and use of Pesticides, Herbicides and Fertilisers should be strictly followed.

Where applicable, the management practices set out for Nitrate Sensitive Areas should be strictly followed.

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.

Water Quantity

To develop and implement a Regional licensing policy that will, at a catchment level, enable the NRA to manage water resources to achieve the right balance between the needs of the environment and those of abstractors, including protection from derogation.

Agricultural activities must be designed and managed to prevent liquid effluent from adversely affecting the quality of surface and groundwaters.

Physical Features

Land drainage activity should not adversely affect the fishery and conservation value of rivers.

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.

4.17 FORESTRY

General

The NRA accepts that well managed forestry, in appropriate areas, can make an important contribution to the environment and the economy. Forestry can, however, influence water quality and quantity through alterations to hydrological and chemical processes in water catchments, and by the import or export of chemicals. Adverse impacts may include:-

- Increased sediment load and run-off rate to rivers that can increase the flood defence maintenance requirement and may also destroy key conservation features.
- Reduced water yield as the trees intercept more rainfall.
- Enhanced acidification in sensitive areas as the trees capture more acidic pollutants from the air.
- Pollution by fertilisers and pesticides applied to the crop.

These impacts can have implications for water supply, aquatic conservation and fisheries. Following the rapid expansion in afforestation over the past 40 years, further concerns are the increasing rates of clearfelling and replanting which can have similar adverse effects.

Consequently the NRA has worked closely with the Forestry Authority in the production of Forests and Water Guidelines which lay down standards for best practice designed to minimise impact of forest management on the water environment. The NRA is consulted informally on applications for new planting but has requested statutory consultee status on planting grants and felling licenses. While forest development is outside the normal planning process, some local authorities have decided to produced Indicative Forestry Strategies which will identify preferred and sensitive areas for forestry. The NRA will advise on water interests in relation to these strategies.

Local Perspective

Coniferous forestry forms the major land use in the Afan catchment with near complete coverage upstream of Cwmafan. This encompasses the Afan and Margam Forests which are owned and managed by Forest Enterprise. The forests are mature in many areas, having been planted in the 1950s. Harvesting is ongoing in 3-5 hectare blocks, replanting with similar conifer species. The major harvesting period is planned for the end of the century.

A similar pattern is repeated in the Kenfig catchment where the Margam Forest extends to cover the upper reaches of the catchment. The only significant areas of broad leaved trees are to be found in the area to the west of Pyle, most notably the woods bordering Margam Country Park.

Problems due to acidification have been noted in several of the Afan tributaries, including the Gwenffrwd and Blaenpelenna. Efforts to ameliorate some of these effects are being undertaken by Forest Enterprise in the form of felling conifers along watercourses, and replanting with broad leaved trees. These activities are currently being carried out in the Cwm Philip and Cwm Maelwg Valleys, which are tributaries of the Kenfig, upstream of Margam Park.

Aim

To protect the water environment from the potentially adverse effects of forestry and to maximise the environmental benefits.

Environmental Requirements

Water Quality

The provisions of the Forests and Water Guidelines should be complied with in all cases to minimise the impact of forestry on water quality.

Water Quantity

To develop and implement a Regional licensing policy that will, at a catchment level, enable the NRA to manage water resources to achieve the right balance between the needs of the environment and those of abstractors, including protection from derogation.

Forestry activities, afforestation and deforestation must not result in reduced reservoir yields or adverse effects on surface water flows or groundwater resources.

Physical Features

The provisions of the Forests and Water Guidelines should be complied with in all cases to minimise the impact of forestry on the physical environment and to gain the greatest environmental benefit, particularly in riparian areas

Footnote:

The NRA has recently joined with the Forestry Authority, in an agreement regarding consultation on new forest planting in acid sensitive areas. Although full details were not available at the time of production, future CMPs will reflect this agreement, together with the results of consultation on broader forestry matters.

4.18 MINERAL EXTRACTION

General

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 the NRA. 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 and 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 such discharges are licensed and monitored by the NRA.

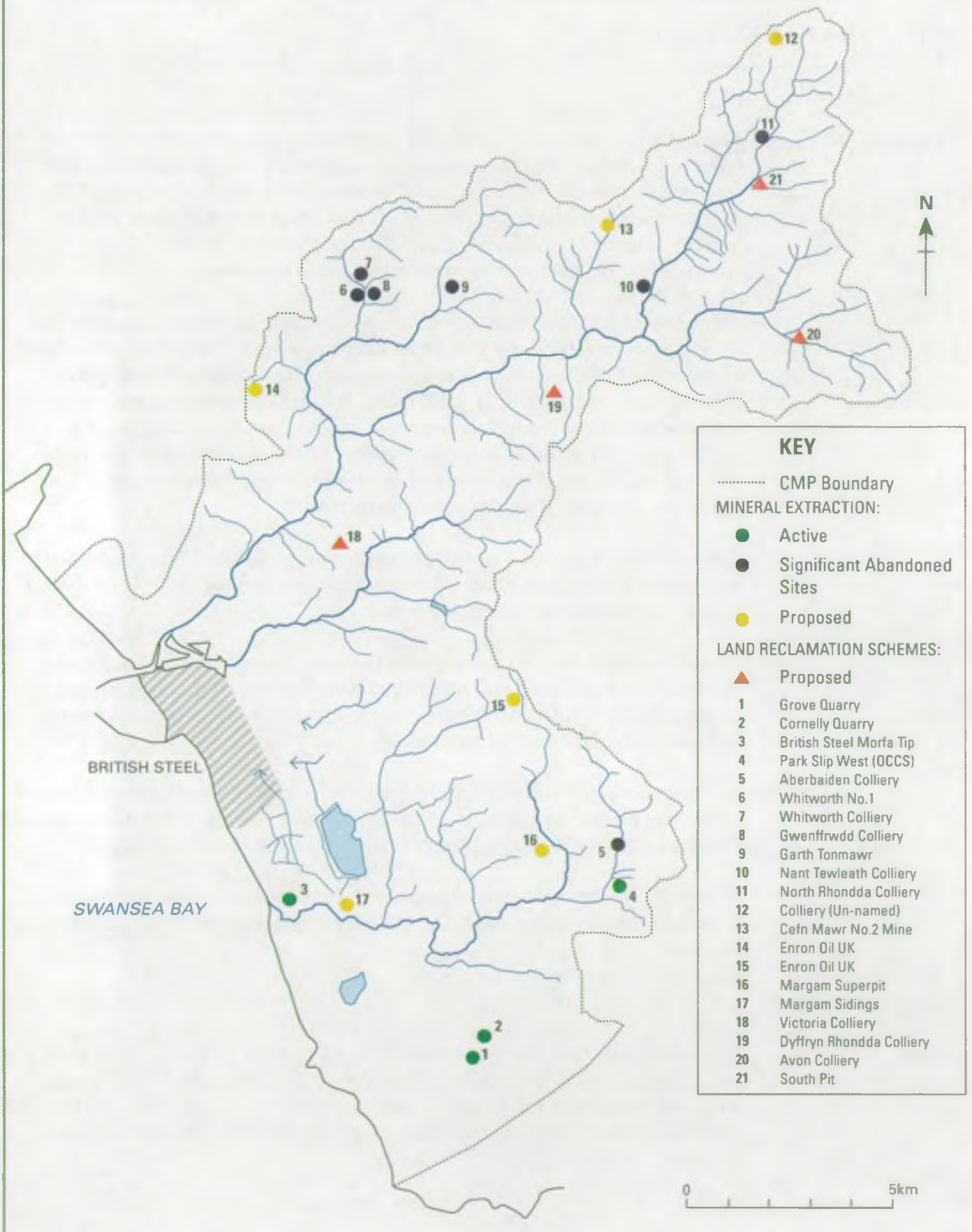
All mineral workings are subject to general planning control and the NRA is a consultee on such applications and considers each application on a case by case basis.

Local Perspective

Coal

Extensive coal mining in the area has left a legacy of problems with spoil tips, dereliction and ferruginous minewater discharges. Land reclamation work has been proposed for the former South Pit on the Corrwg, Dyffryn Rhondda Colliery tips on the Afan, Avon Colliery at Blaengwynfi and Victoria Colliery on the Ffrwd Wyllt.

MAP 22. MINERAL EXTRACTION



KEY

CMP Boundary

MINERAL EXTRACTION:

- Active
- Significant Abandoned Sites
- Proposed

LAND RECLAMATION SCHEMES:

- Proposed

1	Grove Quarry
2	Cornelly Quarry
3	British Steel Morfa Tip
4	Park Slip West (OCCS)
5	Aberbaiden Colliery
6	Whitworth No.1
7	Whitworth Colliery
8	Gwenffrwdd Colliery
9	Garth Tonmawr
10	Nant Tewleath Colliery
11	North Rhondda Colliery
12	Colliery (Un-named)
13	Cefn Mawr No.2 Mine
14	Enron Oil UK
15	Enron Oil UK
16	Margam Superpit
17	Margam Sidings
18	Victoria Colliery
19	Dyffryn Rhondda Colliery
20	Avon Colliery
21	South Pit

Many abandoned coal mines produce discharges of acidic water which contain high levels of iron and other metals. These discharges are exempt from the normal statutory controls but can cause orange coloured iron compounds to be deposited on river beds. This dramatic discoloration and siltation can smother organisms living in the river bed gravels and prevent normal populations of fish surviving. The Iorwerth Goch, Corrwg Fechan, Corrwg, Nant Gwynfi, Pelenna and Ffrwd Wyllt are all visibly affected by acid mine drainage.

The NRA is collaborating with West Glamorgan County Council in a major scheme in the River Pelenna sub-catchment, funded by the EC LIFE programme and the Welsh Development Agency (WDA), with additional financial support from the BOC Foundation for the Environment. A treatment system based on constructed wetlands is to be used to treat five discharges of acid mine water from abandoned mines. The scheme is intended to benefit the Pelenna but also to act as a demonstration project for the whole of Europe. Associated with the Pelenna scheme, the WDA intends to restore and landscape an area of coal spoil tips at Middle Mine, on the Nant Blaenpelenna.

Following a Public Inquiry, planning consent has recently been granted for the latest phase of the Park Slip Opencast Coal Site, Park Slip West. Operations are expected to begin during 1995.

There is an existing authorisation for the Margam Superpit colliery at Penybryn, Margam, but this is not expected to operate in the foreseeable future.

There are currently no active coal mines in the catchment but proposals have been submitted for mines on the rivers Cregan and Corrwg, both in the Afan catchment.

Other Minerals

There is an existing authorisation for British Steel to extract sand as part of their Morfa Tip operations, and there is a possibility that sand will be extracted at the former Margam Sidings.

Limestone is extracted at the Cornelly Quarry, principally for use within the Port Talbot Steelworks and general construction use. The nearby Grove Quarry operates on a smaller scale, supplying construction materials and manufacturing concrete products on site.

Enron Oil UK Ltd have submitted plans to sink two prospecting wells, near Efail Fach and on Margam Mountain, to investigate the possibility of exploiting the reserves of methane contained in deep coal seams.

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 deterioration in water quality above a consented discharge, from that assumed when the discharge consent was calculated.

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 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.

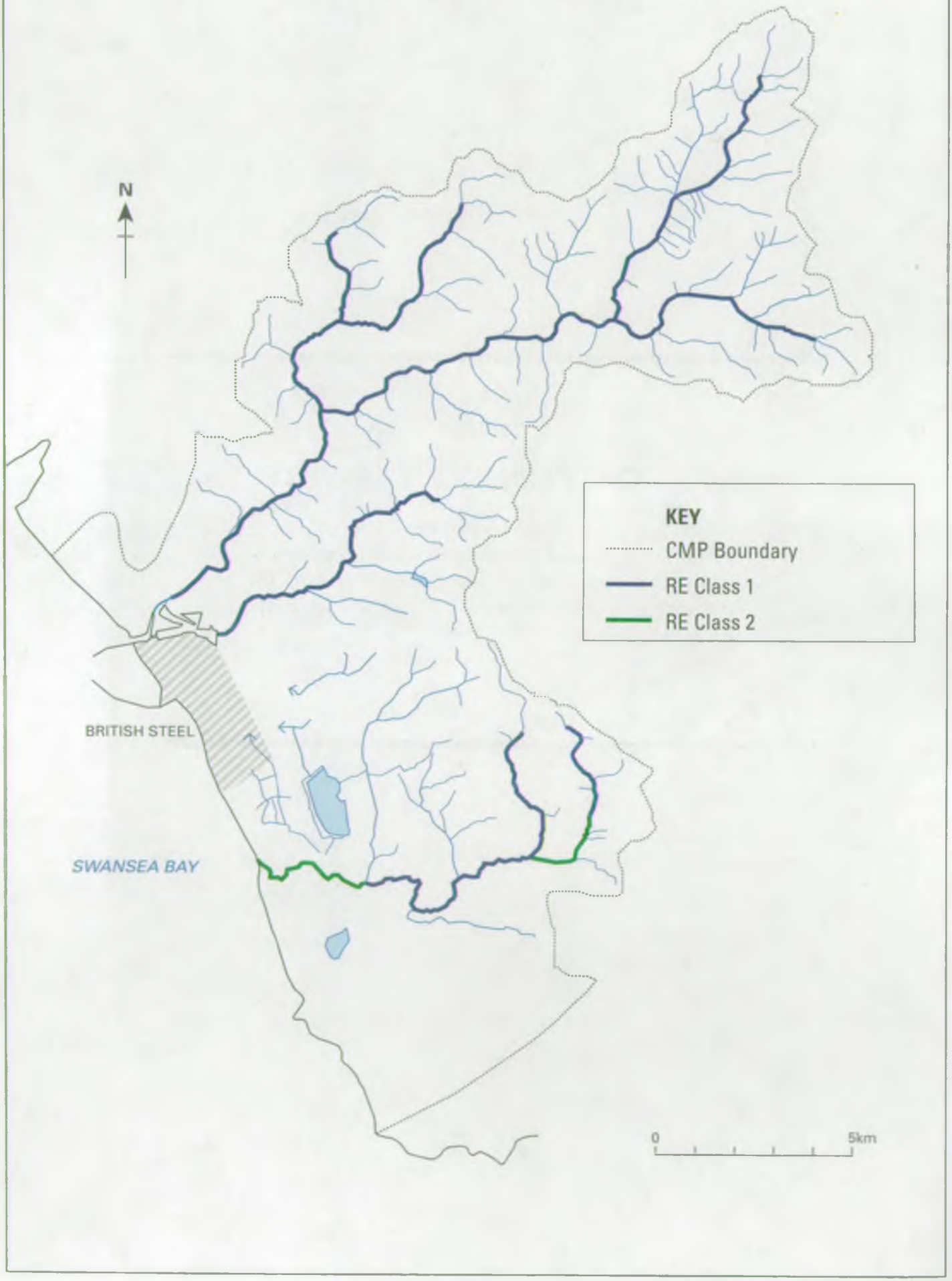
The aesthetic quality of restored landscapes should be in keeping with the overall nature of the catchment and reflect the local needs for amenity and recreation.

5.0 CATCHMENT TARGETS

In this section targets are set for Water Quality, Water Quantity and Physical Features, which are designed to protect the most sensitive Use for each part of the catchment. In this manner any other Uses that have less stringent needs are also protected.

MAP 23.

WATER QUALITY TARGETS - RIVER ECOSYSTEM (RE)



5.1 WATER QUALITY TARGETS

General

The NRA uses two major schemes for the reporting of river water quality: the General Quality Assessment (GQA) scheme, which is used to make periodic assessments of the water quality; and the statutory Water Quality Objectives (WQOs) scheme, which is used for the setting of water quality planning targets. These new schemes have replaced the National Water Council (NWC) scheme, upon which previous references to water quality have been based.

The General Quality Assessment (GQA)

The GQA classification provides a means of accurately assessing and reporting on the general state of river water in a nationally consistent manner. It is used to support periodic assessments of the quality of river water in order to report upon geographical and temporal trends in river water quality. The GQA scheme will ultimately comprise four components - general chemistry, nutrients, aesthetics and biology - each providing a discrete 'window' upon the quality of river stretches. At present only the water chemistry element is established.

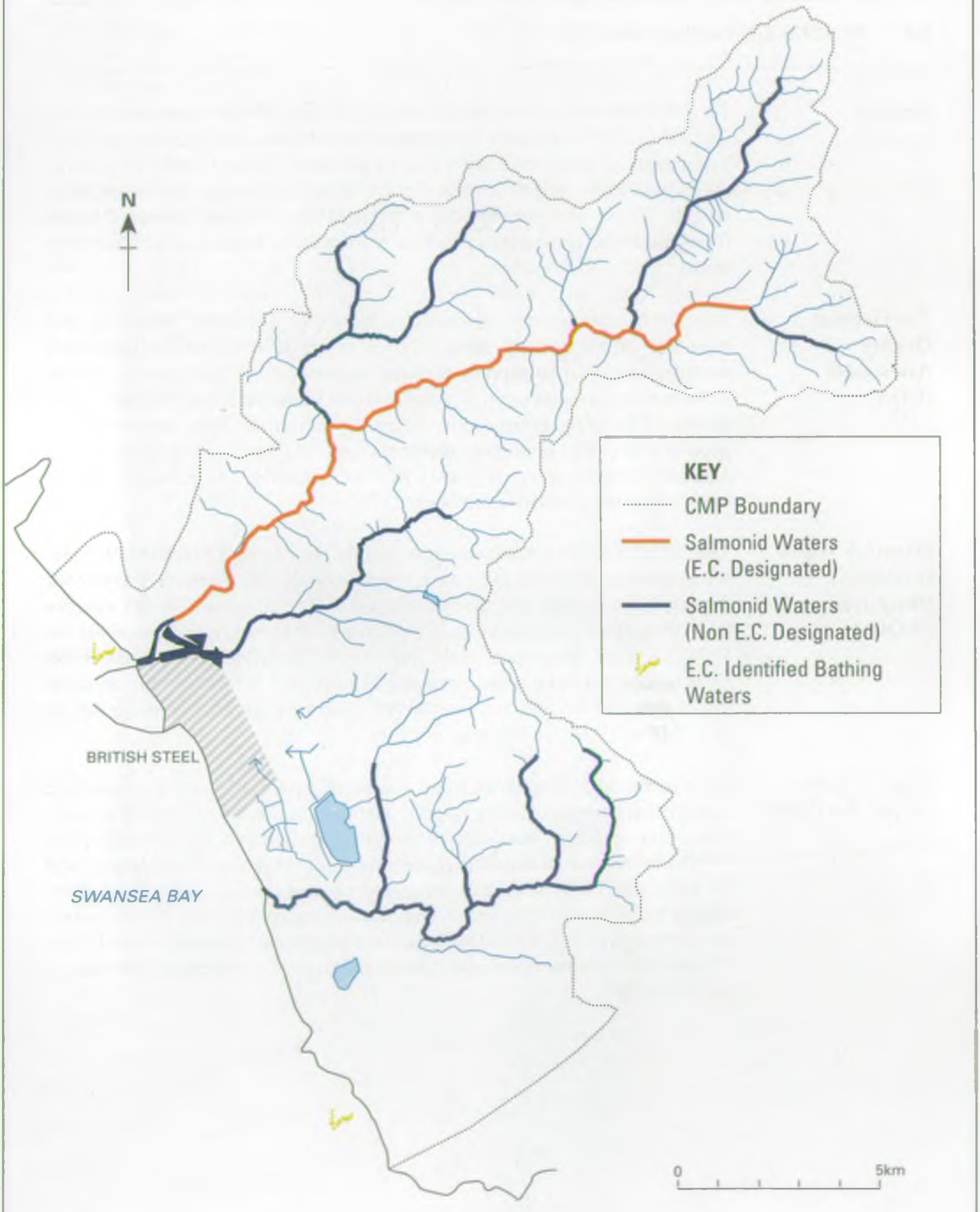
Statutory Water Quality Objectives (WQOs)

The WQO scheme establishes clear quality targets in Controlled Waters, on a statutory basis, to provide a commonly-agreed planning framework for regulatory bodies and dischargers alike. The proposed WQO scheme is based upon the recognised Uses to which a river stretch may be put. Of the 5 WQO Uses proposed, only the River Ecosystem Use has been implemented, and so far only informally. However, it is feasible that, at some future date, the River Ecosystem targets proposed for each river stretch in this CMP will be given statutory backing.

Water Quality Targets for CMPs

For Catchment Management Plans the performance of waters is assessed against specific water quality targets. The targets are set to protect specific Uses of the catchment (including those that will ultimately be covered by the WQO scheme) and call on water quality standards that have been determined for each use. These standards are based on the existing sources of data, especially the River Ecosystem Classification regulations and EC Directive for Bathing Water, Freshwater Fisheries, Dangerous Substances and Urban Wastewater Treatment and are constructed to give a complete coverage of water chemistry.

MAP 24. WATER QUALITY TARGETS - GENERAL



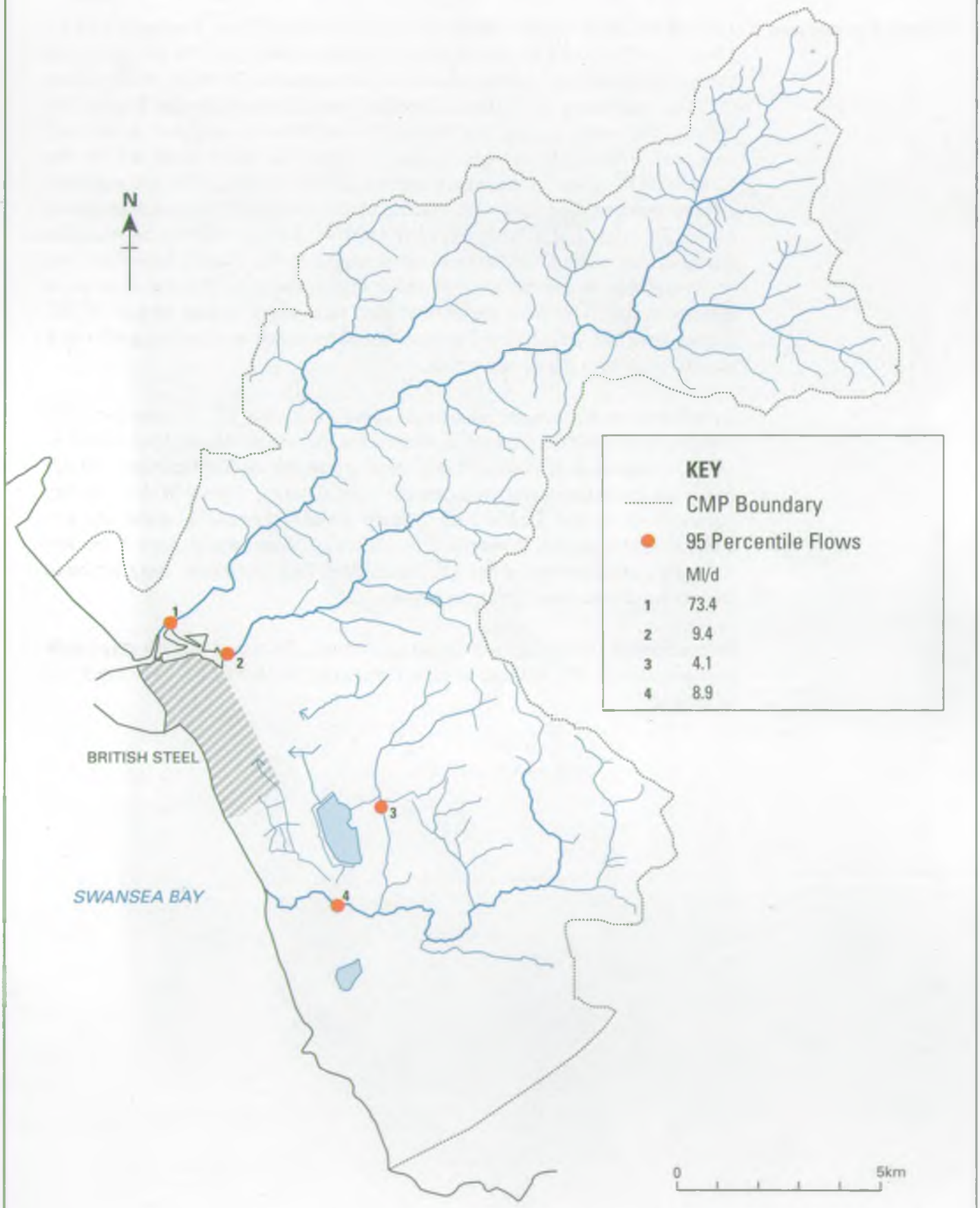
Local Perspective

Long Term River Quality Objectives (LTRQOs) of River Ecosystem (RE) Class 1 are proposed for the whole of the catchment, with the exception of the Kenfig downstream of the Afon Fach, which has an LTRQO of RE Class 2. This represents the NRA's vision for the catchment in the future and reflects the water quality that should be expected to support a thriving salmonid fishery. Water quality targets have therefore been set at the LTRQO of RE Class 1 (and where appropriate RE Class 2) for the majority of river reaches. For the lower reaches of the Iorwerth Goch, achievement of the RE Class 1 standards required for the LTRQO will not be possible during the life of this CMP, so short term targets of RE Class 2 have been set to ensure that no deterioration in water quality occurs. For the Pelenna a derogation for pH has been applied and short term water quality targets of RE Class 1 have been set. This will ensure that deteriorations in aspects of water quality other than pH do not occur.

In addition to RE targets, standards specified in the EC Freshwater Fish Directive (78/659/EEC) are set as targets for the whole of the Afan which is an EC designated salmonid fishery upstream as far as Blaengwynfi. Much of the rest of the catchment, including the Nant Corrwg, Ffrwd Wyllt, Kenfig, Iorwerth Goch and Castle Mill Stream should achieve a water quality suitable for supporting salmonid fish. Although these watercourses are not formally designated under the EC Freshwater Fish Directive, the standards therein have been set as informal targets.

Where bathing takes place within the catchment, the water quality standards contained in the EC Bathing Waters Directive (76/160/EEC) have been set as targets.

MAP 25. WATER QUANTITY TARGETS



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.

The NRA takes a precautionary approach to the granting of new licences, and will only grant them if it is confident that the available resources are able to sustain the proposed abstraction in the long term without harm to the environment or existing abstractors. The NRA also regularly monitors the compliance of abstractors with licence conditions and enforces as necessary.

The NRA currently is developing an abstraction licensing policy that will allow it to consider in a structured way the environmental needs of the river system and to balance these with the needs of abstractors. The policy, when developed, 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 the production of Catchment Management Plans will aid this process.

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

The NRA has powers to limit abstraction and take other conservation measures in periods of drought.

Local Perspective

By far the largest single abstractor of water in the catchment is British Steel and an adequate supply of water is crucial to the operation of their site. Their abstractions have a direct impact on four separate watercourses, the Afan, Kenfig, Castle Stream and Ffrwd Wyllt.

Apart from any small private domestic supplies, all potable water comes from outside of the catchment. Therefore any increase in demand for mains water is likely to impact upon sources outside of the catchment.

Flow Requirements In the absence of the policy to assess in-river needs for the watercourses within the catchment, the natural 95 percentile flows have been calculated to give an indication of the flows that should be the targets for protection when considering abstraction licence applications (see Map 25).

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. The NRA is also 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 certain specified flows at different points in its length.

Local Perspective

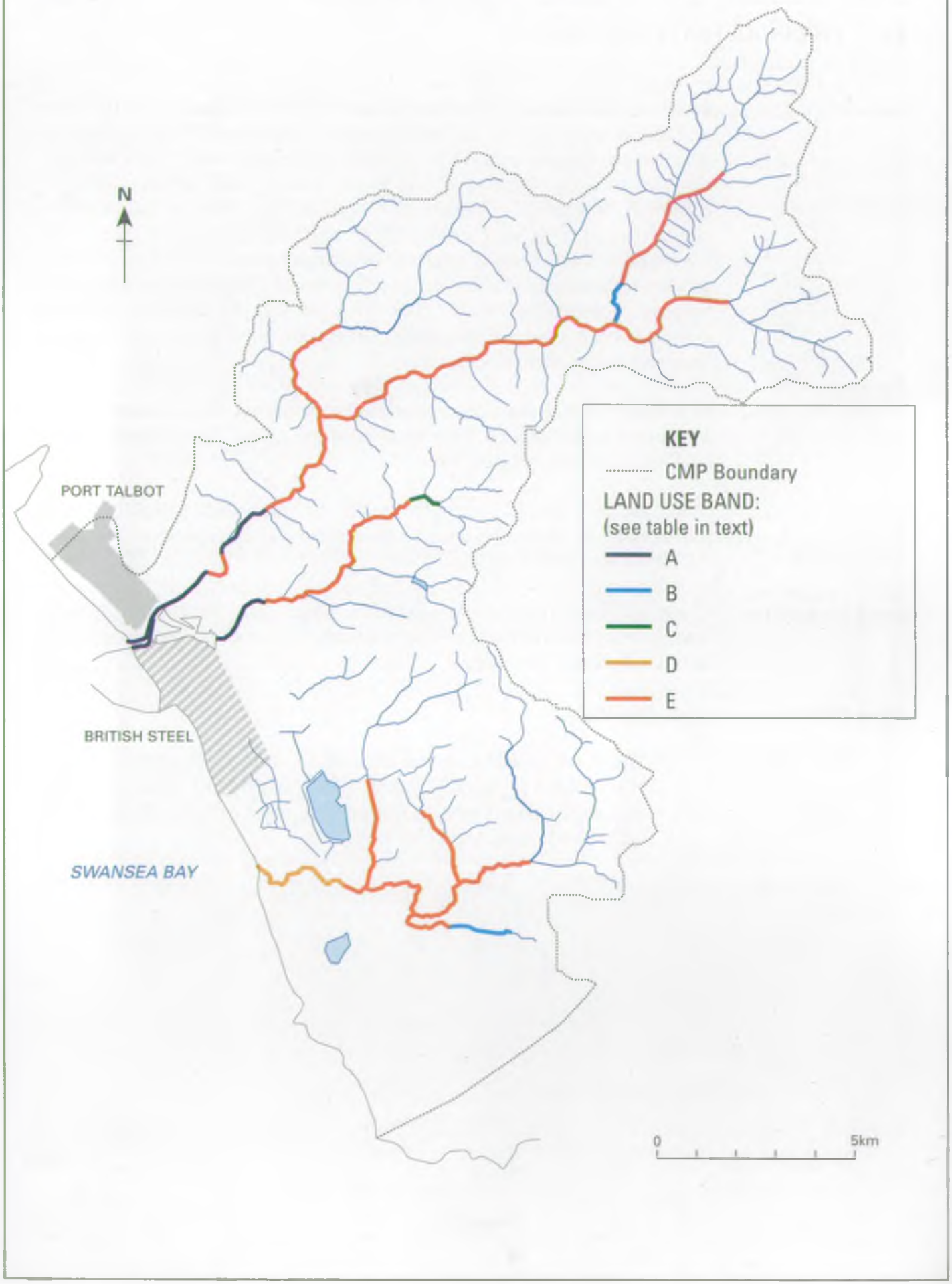
There are many Uses in the catchment which have their own physical features requirements. The following requirements are considered targets for the Afan & Kenfig catchments:

Flood Defence

Flood Protection

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

MAP 26. FLOOD DEFENCE TARGETS



Land Use Band	Typical Description of Reach	Reference SoS - Flood Return Period (Years)	
A	Contains residential and non-residential properties distributed over a significant proportion of its length. Amenity uses may be prominent.	Fluvial	Tidal
		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.

Water Level Management Plans will be prepared for all sites agreed with the Countryside Council for Wales.

Regulation and Enforcement

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 (1994), 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 Water Resources Act 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 WO 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).

Flood Warning

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

Fisheries

Through its operational, regulatory and advisory activities, and particularly in its role as a statutory consultee to the Local Planning Authorities, the NRA 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.

- The NRA has declared its intention in its recently published Fisheries Strategy to set specific targets relating to fish stocks and spawning success. The results of continuing fisheries monitoring surveys in the catchment will assist in the determination of these targets, as will the data collected from rod and net catch returns.

Conservation

The NRA is currently developing a national habitat classification scheme. This scheme, and the results for the 1993 River Corridor Surveys, will assist in setting specific targets for conservation.

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

- the current diversity of natural features such as bankside features, wetlands, emergent vegetation, meanders, pools and riffles are maintained in order to conserve river corridors and safeguard landscape quality; improvements are effected and degraded features reinstated where possible. In order to achieve this, water fringe buffer zones should be fenced off wherever possible to protect waterside habitats from damage. Livestock watering points should be clearly defined to protect river banks from degradation.

- for each SSSI and NNR potentially affected by NRA activities, a "standard of service" that will maintain, and if possible enhance, the conservation value of the site, is agreed with CCW.

- areas of degraded wetland and riverine habitat are identified and, where possible, restored to a level at which they support a range of species typical of similar habitats elsewhere in the catchment.

- the physical structure of archaeological sites and their settings is maintained and, where possible, enhanced, recognising the interdependence of many of the sites and monuments. Where unavoidable change occurs, the original detail of the site should be carefully recorded.

- the survival and, where necessary, reinstatement of threatened fish populations is promoted. This will include not only rare species (e.g. shad), but also specific local strains of more common native species.

- control of the spread of Japanese Knotweed and other alien weeds is undertaken as required under the Wildlife & Countryside Act 1981.

Recreation

Through its operational, regulatory and advisory activities, and particularly in its role as a statutory consultee to the Local Planning Authorities, the NRA 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.

- provision is made for both canoe touring and white water canoeing, where appropriate, within the catchment.

Having identified and described the legitimate Uses in the Afan and Kenfig catchments, and set targets to support them in terms of water quality, water quantity and physical features, the ability of the catchment to support these Uses has been assessed. Significant areas of conflict between legitimate Uses have been identified. The results of this analysis are presented in Section 3, Part I of this report.

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 Afan and Kenfig catchments. 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 m^3	**5 - 20 m^3**	**Above 20 m^3**
One off, any purpose	No restriction	Consent	Licence
	0 - 5 m^3/d	**5 - 20 m^3/d**	**Above 20 m^3/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

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 Afan and Kenfig Catchments

Data from biological surveys carried out during 1990, 1991 and 1992 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.

APPENDIX 3

GLOSSARY OF TERMS, UNITS AND ABBREVIATIONS

ABSTRACTION

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

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 horizontal passage or entrance/exit in a mine.

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

Layers of rock (usually sub-surface) that are able to hold or allow water to travel through them.

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 issued by the NRA 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 costal waters to three nautical miles from the shore.

CULVERT

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

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

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.

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.

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.

HABITAT

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

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.

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.

m^3/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 river flows.

MACROINVERTEBRATE FAUNA

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

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 river flows.

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 year 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.

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 collected by unmanned monitoring stations (often for river flows or rainfall) using a computer that is connected via the public telephone system.

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.

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.