ANGLESEY
CATCHMENT MANAGEMENT PLAN
CONSULTATION REPORT: 1996

NRA

National Rivers Authority
Welsh Region

ANGLESEY CATCHMENT MANAGEMENT PLAN

CONSULTATION REPORT

FEBRUARY 1996

National Rivers Authority
Welsh Region

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Acknowledgement:-

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THE NRA's VISION FOR THE MANAGEMENT OF THE ANGLESEY CATCHMENT

The island is unique, with the existing landscape being the result man's changes to the land use over centuries, combined with the effects of being exposed on all sides to the sea and receiving little shelter from the elements. The consequences of this long history provide us with a spectacular coastline of cliffs and sandy beaches together with lakes, marshes and fens of considerable conservation importance. The island is greatly valued by it's inhabitants but also an increasing number of visitors who exploit the extensive opportunities for recreational activities.

A key priority for the NRA must be to ensure that in our regulation of the water environment, and as part of our own operational activities, we do not devalue this inheritance. Furthermore, we need to take direct action, and to inspire and collaborate with others to seek improvements where these are required to protect the many important uses which revolve around the water environment.

Specifically, we believe we can play a key role alongside other conservation bodies, local organisations and landowners to safeguard wetland areas and further develop or recover their conservation potential. Our involvement in the Anglesey Wetlands Strategy is a demonstration of this. We will also be developing Water Level Management Plans for a number of sites to achieve the right balance between land use and conservation. We will be looking for early and substantial improvements to the treatment of sewage for a number of communities, in particular where the absence of adequate treatment facilities constrains development or adversely affects recreational uses. Dŵr Cymru Welsh Water has already embarked on a substantial investment programme which will benefit the Island; we will continue to exert our influence to ensure that this investment is appropriately allocated and that the benefits are realised at the earliest opportunity.

Altogether, we have identified 23 issues for which we believe we have a role, in many cases in collaboration with others, to identify and progress solutions. We need your views on these issues and for you to identify any further issues that we may have excluded. The success of this approach to management of the water environment depends on the cooperation and contributions of other agencies, local government, industry, landowners and the people who live and work on the Island.

We have a vision whereby the issues we have identified, and those you advise us of, will be resolved and all legitimate uses of the water environment can co-exist and develop in harmony. We will encourage imaginative proposals that allow sustainable economic and community development to proceed whilst ensuring protection and improvement of the water environment. We will collaborate actively with all users and statutory bodies that can assist us in striving to achieve this vision.

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PART I

THE ANGLESEY CATCHMENT MANAGEMENT PLAN

1.0 THE PURPOSE OF CATCHMENT MANAGEMENT PLANS

1.0 THE PURPOSE OF CATCHMENT MANAGEMENT PLANS (CMPS)

1.1 THE ROLE OF THE NRA

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

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

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

We believe that it is important that the interests of all water users are considered in the development and protection of the water environment. Consequently, we have 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 Anglesey catchment, and is based on a detailed study that we carried out during 1995. A number of proposals are presented for comment and it is intended that, following consultation with you and other river users, an Action Plan will be presented which will seek to manage conflicts in river use and optimise the overall benefits to all river users within the catchment.

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

This consultation document is divided into 2 parts:

Part I: Presents the range of management issues, and options to address them, that have been identified by the NRA;

Part II: Provides background information on the approach we took in developing this plan, using information on identified river Uses (including those to be incorporated in the new Water Quality Objectives scheme) and the statutory and informal targets required to support them. The targets are expressed in terms of water quality, water quantity and physical features.

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

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

The Area Catchment Planner
National Rivers Authority
Ffordd Penlan
Parc Menai
Bangor
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LL57 4BP

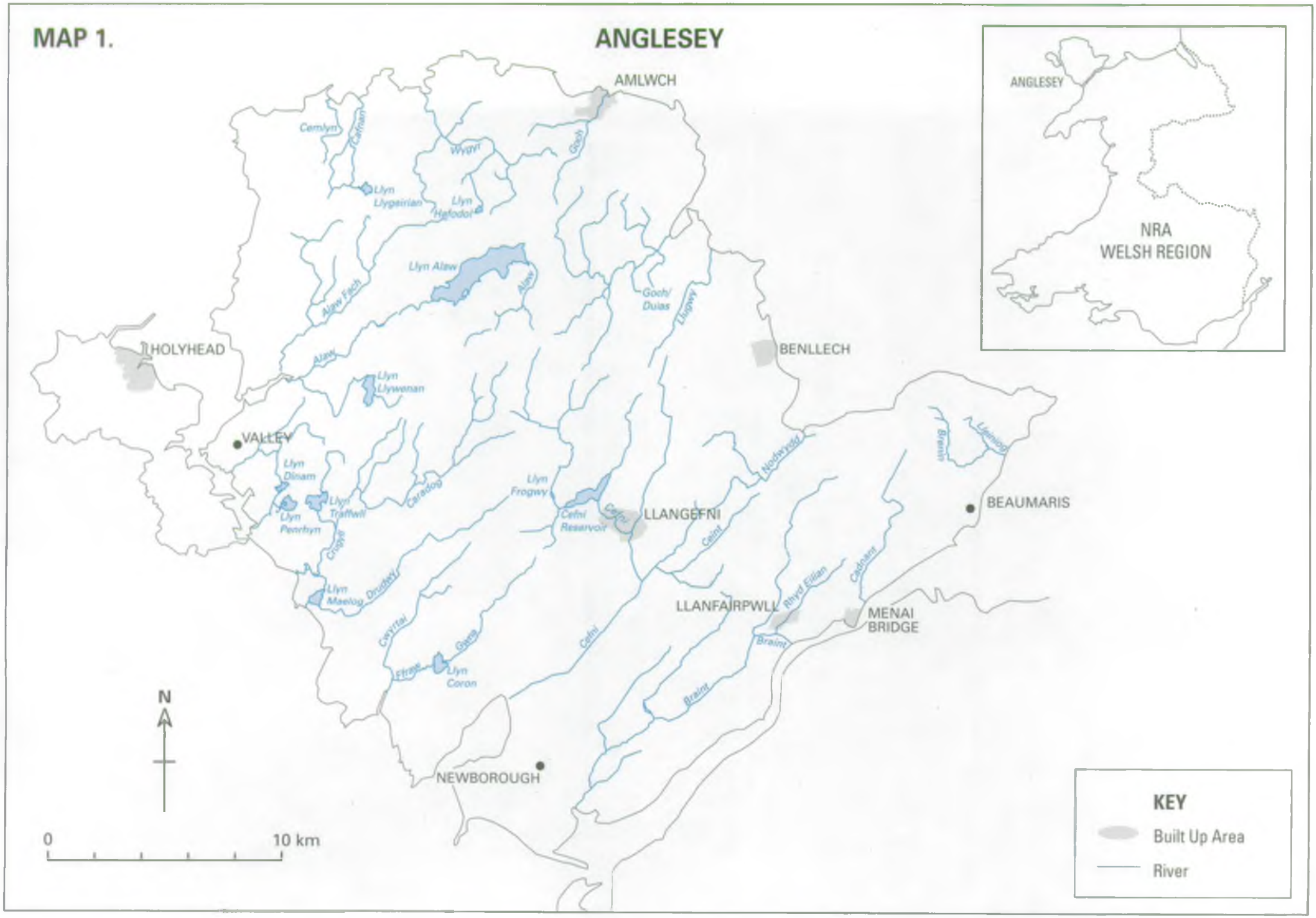
Telephone: (01248) 670770

The Environment Agency.

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

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

2.0 AN OVERVIEW OF THE ANGLESEY CATCHMENT


MAP 1.
ANGLESEY
AMLWCH
HOLYHEAD
VALLEY
BENLLECH
BEAUMARIS
LLANGEFNI
LLANFAIRPWLL
MENAI BRIDGE
NEWBOROUGH
Cemlyn
Carnan
Wygyr
Goch
Llyn Llygeirian
Llyn Hafodol
Llyn Alaw
Alaw Fach
Alaw
Gooh/ Duas
Lligwy
Llyn Llywenan
Llyn Dinam
Llyn Traffwll
Llyn Penrhyn
Caradog
Llyn Frogwy
Cefni Reservoir
Cefni
Nodwydd
Braint
Llanidan
Ceint
Rhyd Eilian
Cadnant
Braint
Braint
Cefni
Crigyll
Llyn Maelog
Drudwy
Cwyrtai
Efrage
Gwna
Llyn Coron
ANGLESEY
NRA
WELSH REGION
N
0
10 km
KEY
Built Up Area
River

2.0 AN OVERVIEW OF THE ANGLESEY CATCHMENT

2.1 INTRODUCTION

NRA river catchment management plans are normally prepared to address individual river catchments, or occasionally a group of two or more small river systems. The geographical unit of Anglesey cannot however be readily separated into river catchments, the island being drained by numerous small streams and rivers. It makes great sense therefore to deal with the island as a discrete unit and this enables particular consideration to be given to the extensive and important coastline upon which the island depends.

Anglesey is renowned for tourism, which is not surprising given its many attractions including a largely unspoilt coastline, opportunities for water sports enthusiasts and its proximity to Snowdonia. The influx of tourists is catered for by numerous caravan and camping sites and hotels, with approximately 33,000 bedspaces available throughout the island. It has a rich archaeological heritage and an abundance of areas of high conservation value, including much of the coastline which is designated as an Area of Outstanding Natural Beauty.

The coastline is rocky, interspersed by small bays and estuaries. There are however, many sandy beaches, some of which are quite extensive. The waters around the coast have been the subject of detailed studies over a long period, particularly those around Puffin Island and in the Menai Strait.

Due to the relative flatness of the island, its rivers tend to be slow moving and in places even sluggish. The rivers and lakes are often rich in nutrients, encouraging algal growth which can prove problematic to their users. However, this richness also sustains an abundance of wildlife which contributes to the varied and valuable ecology of the island.

2.2 INFRASTRUCTURE

The A5 between Llanfairpwll and Holyhead is part of a designated international Connecting Route (Euroroute) that links Ireland, by the port of Holyhead, to the rest of the European Community. The A5, together with a trunk road system around the perimeter of the island, link the major settlements, with smaller villages towards the centre of the Island being served by a network of 'B' roads.

The main inter-city (Chester-Holyhead) railway line crosses the island to the south of the A5. A branch line connects Amlwch to the main line at Gaerwen, although this is infrequently used and solely for the transport of goods.

There are no passenger airport facilities on the island although there are RAF airfields at Valley and Mona, the latter also being used for civilian pilot training.

2.3 LAND USE

The Island is predominantly rural with a population of 69,149 recorded in 1991 and 40 Community Council areas, three of which (Holyhead, Llangefni and Amlwch) support 30% of the overall population.

With over 70% of the Island dedicated to arable farming and permanent grassland, agriculture is the predominant land use providing direct employment to 2,700 workers.

There is a variety of industrial and commercial development on the island, mostly confined to dedicated sites within Holyhead, Llangefni, Gaerwen, and Amlwch. The nuclear power station at Wylfa employs over 550 people, the majority of whom live in the north of the island.

The NRA is a statutory consultee for Town and Country Planning matters (development plans and development control) and will advise the local planning authorities (LPAs) on development proposals which, if progressed, would impact on the water environment.

2.4 FLOOD DEFENCE

Flood defence activity within the catchment is concentrated on the maintenance of tidal and fluvial defences, main river watercourses and adopted ditches.

The low lying Malltraeth Marsh is the only extensive area threatened by tidal inundation within the catchment. The area at risk is an Internal Drainage District (IDD), known as Malltraeth Marsh IDD.

Elsewhere in the catchment flood defence work consists mainly of deweed/desilt and river management schemes carried out when and where necessary. There are no major main river flooding problems where property is affected, although the agricultural flood plains are inundated from time to time. There are, however, a few isolated cases of flooding to properties associated with non-main rivers within the catchments.

Water Level Management Plans will be drawn up for all sites agreed between us and the Countryside Council for Wales. A three year prioritised programme for the production of these plans will be undertaken.

2.5 HYDROLOGY & HYDROGEOLOGY

Anglesey is composed of rock types which range in age from the pre- Cambrian through to the Triassic. Glacial action has given the island its present low lying and gently undulating topography, from which isolated hills of more resistant material rise above the general surface. The island was completely covered by ice sheets in glacial times leaving a thick mantle of boulder clay deposits which are now extensively cultivated.

The principal rivers generally follow the structural trend and run in a NE to SW direction from the main watershed which lies towards the northern coastline. Of the annual average rainfall of 1000mm half is lost through evapotranspiration. Surface water resources are therefore not plentiful and storage is provided to serve most of the island's water needs at Cefni and Alaw reservoirs. Very little underground water is present in the underlying solid rocks, apart from that found in fissures, mainly in the carboniferous limestone formations. Historically springs and wells issuing from the superficial deposits were extensively used to meet domestic needs. Today the island is mostly reliant on mains water supplied by Dŵr Cymru Welsh Water.

2.6 FISHERIES CONSERVATION & RECREATION

A wide range of species are exploited by fisheries on and around the Island, reflecting the numerous marine, estuarine, river and still water habitats present.

Numerous sea trout run the rivers but the opportunity to fish for them is restricted by the lateness of their migration up-river. A more reliable source of enjoyment for anglers are the put and take trout fisheries such as Alaw and Cefni reservoirs and the growing number of stillwaters providing quality coarse fishing.

In the summer months the rocky outcrops provide excellent sea fishing and the beaches on the West coast provide good bass fishing. In the winter, whiting and codling provide the targets for the hardy sea angler.

The ecological importance of Anglesey is reflected in the designation of the entire island as an Environmentally Sensitive Area (ESA). Over 7,500 hectares are within Sites of Special Scientific Interest (SSSI), 1574 hectares of which have been designated as National Nature Reserve (NNR). In addition, there are 21,497 hectares of Areas of Outstanding Natural Beauty, 31 miles of Heritage Coastline 4 candidate Special Areas of Conservation and 1 Special Protection Area.

Wetlands form a relatively high proportion of protected sites with base-rich fen communities predominant in the east and acid fens prevalent on the west of the island.

Despite these riches, many of the sites have been subject to drainage and exciting projects are underway to restore reed beds with the aim of encouraging bittern and other uncommon swamp loving birds to breed.

The island is popular with holiday makers and water-based activities such as yachting and pleasure boating are major attractions. Windsurfing is enjoyed all around the coastline and the number of participants is increasing each year. The rise in the number of power boats and jet skiis is a potential conflict area with other interests which will need to be addressed.

The NRA does not have any statutory responsibility for Navigation in the plan area.

2.7 WATER QUALITY

The natural chemical composition of surface waters on Anglesey is very different to that on mainland Gwynedd, being much higher in dissolved substances such as calcium and chloride. Hardness and calcium concentrations are about eight times higher compared with the mainland. Such differences result from a combination of the alkaline geology, the influence of the sea and agricultural land use. The enriched chemical composition gives rise to increased algal growth in the lakes and slow moving rivers. This is reflected in algal blooms and a general optimum river water quality standard of General Quality Assessment (GQA) class B.

The shallow lakes of Anglesey are an important conservation and recreational resource, although many are affected by the algal blooms described above, particularly during dry warm summers such as 1995. We are cooperating with CCW and RSPB in finding out more about the history and factors affecting these lakes so that future management can be optimised.

Biological assessment of Anglesey rivers generally indicates good quality. The Afon Goch (Dulas) draining Parys Mountain is a notable exception. It is virtually devoid of insect life due to acid and metal pollution from historical mining activities. Biological sampling of some smaller, unclassified streams in 1994 indicated some localised deleterious impact from farming, particularly in the Hesgyn, Alaw Bach, Braint and Wygyr catchments. A programme of farm visits is underway with the objective of reducing these impacts.

Improvements in sewage treatment at Llangefni STW have resulted in marked improvements in the biological quality of the Cefni downstream of the works. Similarly, the relocation of the discharge from Llanerchymedd STW has improved the quality of the Alaw downstream of this works.

Nearshore sea water samples are currently taken by us at the three EC Identified Bathing Waters namely, Rhosneigr, Trearddur Bay and Benllech. In recent years, the

water quality at these beaches has complied with the standards of the EC Bathing Water Directive (76/160/EEC). Most of the remaining bathing beaches around the Anglesey coastline are remote from towns and villages and water quality is good.

Many of Anglesey's coastal settlements do not yet have any sewage treatment (see Section 4.10) and water quality around the outfalls serving some of these towns can be aesthetically poor.

2.8 MONITORING

Monitoring of daily, and in one instance sub daily rainfall, is carried out at 5 sites on the island, which due to the topography are sufficient to provide a good appreciation of the rainfall pattern across the area. Similarly, the one gauging station on the island provides runoff data which can be used to derive flows for other watercourses.

Currently, no groundwater monitoring is carried out on the island. The monitoring network is under review Regionally and is being expanded in recognition of the importance of groundwater.

Thirteen sites are sampled monthly to assess the chemical quality and periodically to assess the biological quality of classified streams. This national surveillance monitoring is supplemented by a further 26 sites sampled to address particular problems or issues. These include the impact of landfill sites, Parys Mountain, urban and agricultural influences and the water quality of the shallow lakes.

Offshore sea water quality is assessed as part of a national survey using the NRA vessel `Coastal Guardian'. Coastal surveys have also been carried out using remote sensing equipment carried in a small plane. We hope to cross correlate between sea water sample data and the data from the aerial survey.

Ad hoc river corridor and river habitat surveys have been carried out on sections of most main rivers within the catchment.

The salmonid populations of the catchment have been monitored on an ad hoc basis by electro-fishing surveys.

2.9 KEY DETAILS

Area 716 km^2

Main Towns and Populations (1991 Census)

Holyhead	11,782
Llangefni	4,637
Amlwch	3,844
Total estimated population	69,149
Holiday Influx (bed spaces)	33,042

Number of Visitors (1993)

Beaumaris Castle	90,898
Anglesey Sea Zoo	171,000
Pili Palas	78,174
Anglesey Bird World	26,000

Topography

Ground levels	Min level	0 m A.O.D.
	Max level	230 m A.O.D.
Tidal levels	Mean High Water Springs	-3.1 m A.O.D. (Moelfre)
		-2.8 m A.O.D. (Cemaes Bay)
		-2.35m A.O.D. (Holyhead)
		-2.09m A.O.D. (Llanddwyn)
		-3.1 m A.O.D. (Menai Bridge)
	Mean Low Water Springs	3.5 m A.O.D. (Moelfre)
		3.0 m A.O.D. (Cemaes Bay)
		2.55m A.O.D. (Holyhead)
		2.2 m A.O.D. (Llanddwyn)
		3.5 m A.O.D. (Menai Bridge)

Administrative Details

County councils	-	Gwynedd County Council
District councils	-	Ynys Môn Borough Council
National Parks	-	None
NRA	-	Welsh Region - Northern Area
Water company	-	Dŵr Cymru Welsh Water
Assessed Sewage Treatment Works	-	16 Dŵr Cymru Welsh Water; 4 Private

Water Quality Classification River length in General Quality Assessment Class, based on results for 1994.

Class A	(21.3%)	-	15.6km
Class B	(74.%)	-	54.1km
Class C	(1.6%)	-	1.2km
Class D	(3.1%)	-	2.3km

Estuary Classification

Good (NWC Class A)	-	5.9km
Fair (NWC Class B)	-	12.1km
Poor	-	None
Bad	-	None

EC identified bathing waters	-	3 (Rhosneigr, Trearddur Bay, Benllech)
Other bathing waters	-	23

Water Resources

Annual Average Rainfall	-	1030mm (850 - 1050)
Primary Gauging Station	-	1 (Afon Frogwy)
Principal Reservoirs	-	2 (Cefni, Alaw)

Flood Protection

Length of Main River in catchment	443km
Length of Main River within Internal Drainage District	41km
Length of Adopted Ditch within Internal Drainage District	18km
Length of flood banks maintained by NRA	21km
Area at risk of flood (tidal or river)	1,969Ha

Fisheries

Length of watercourse designated under EC Directive (78/659/EEC) on "The Quality of Fresh Waters needing Protection or Improvement in Order to Support Fish Life".

Salmonid	-	Nil
Cyprinid	-	Nil

Conservation

Sites of Importance	58

3.0 ISSUES AND OPTIONS

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

- Section 3.1 identifies in detail, those areas that fail to meet specific targets to support identified Uses. Significant areas of conflict between Uses are also discussed.

- Section 3.2 presents these **Issues** along with **Options**, identified by the NRA, to address them.

- The background information that has been used to identify these Issues is provided in **Part II** of this report, which lists the known Uses of the catchment and sets targets to support them.

- You should note that the Issues and Options do not constitute NRA policy but have been considered within our policy framework: no priority should be inferred from the order in which they appear.

3.1 THE STATE OF THE CATCHMENT

- This section reviews the current quality of the catchment against the Targets set in **Section 5** in **Part II**.

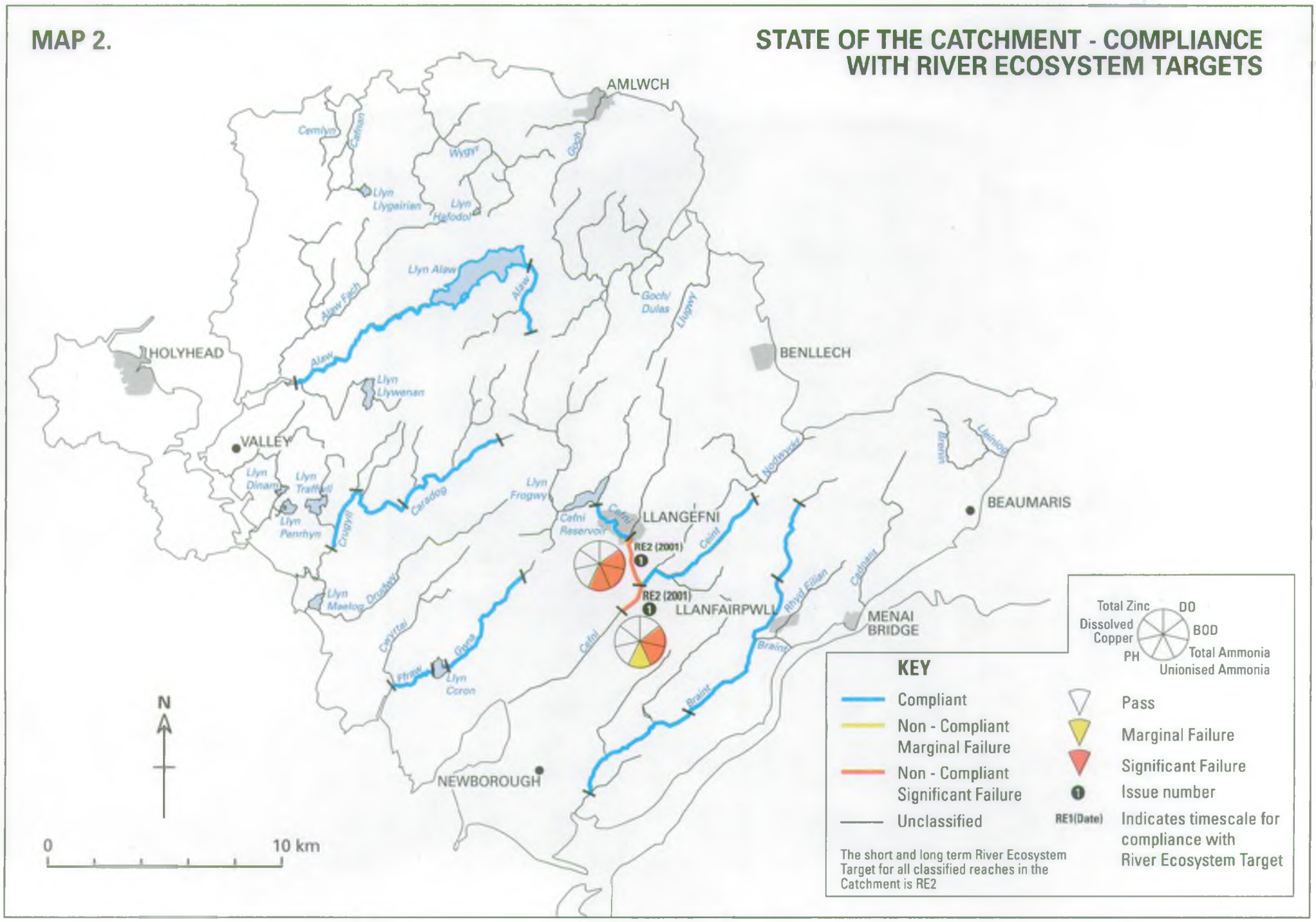
- The **Targets** are designed to protect the needs of the identified catchment Uses.

- The targets are also guided by the concepts of **sustainable development** and **environmental capacity.**

- This allows the key management **Issues** to be identified: potential solutions are addressed in **Section 3.2**.

MAP 2.

STATE OF THE CATCHMENT - COMPLIANCE WITH RIVER ECOSYSTEM TARGETS



3.1.1 WATER QUALITY

General

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

Local Perspective

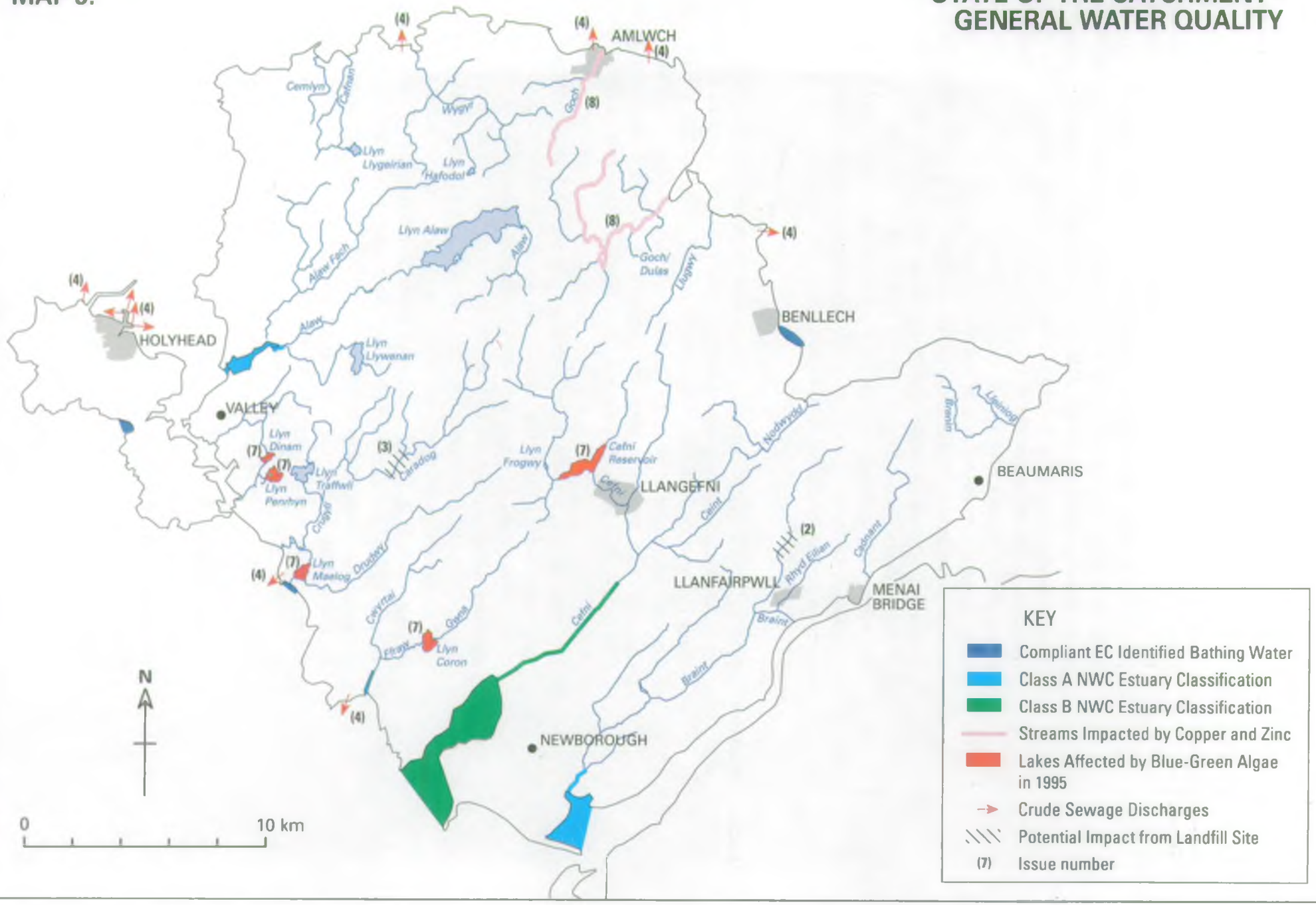
Map 2 identifies those river stretches where the water quality has failed to meet the River Ecosystem targets set in Section 5.1. The proposed targets are those required to protect the Uses identified in Section 4 of this document. They are expressed in terms of the River Ecosystem Class into which the stretch of river has fallen when compared to the standards set down in the "Surface Waters (River Ecosystem)(Classification) Regulations 1994".

The water quality, as assessed by both chemical and biological monitoring in the rivers covered by this plan, is generally good. The main exception is the Cefni downstream of Llangefni Sewage Treatment Works (STW). Here two stretches failed to meet the targets for ammonia and Biochemical Oxygen Demand (BOD). One stretch only achieved RE4 whilst the other achieved RE3. Some sewage treatment works improvements were carried out in 1992. In June 1995, in an effort to improve effluent quality, Dŵr Cymru Welsh Water (DCWW) installed sand filters at the works and tightened up control of trade effluents discharged to the sewerage system. It is too early to tell if these measures will achieve the Long Term River Quality Objective of RE2. However, biological evidence shows that the river has improved dramatically since 1990. Sampling at Pont y Gors has shown the biological rating score between 1991 and 1994 has increased from 'poor' to 'good'.

Many of Anglesey's shallow lakes and reservoirs suffer from algal blooms which result from a combination of nutrient availability and weather conditions. During 1995, Cefni Reservoir, Llyn Coron, Llyn Maelog, Llyn Penrhyn and Llyn Dinam all supported blue-green algal blooms. Some blue-green algae can produce toxins, with the main risk being to pets and

MAP 3.

STATE OF THE CATCHMENT - GENERAL WATER QUALITY



recreational users of lakes who may ingest the concentrated scums that can form around lake margins.

Whilst point sources of nutrients such as sewage discharges can be controlled, diffuse run-off of phosphates and nitrates from agricultural use is much more difficult to control. In conjunction with other conservation bodies such as CCW and RSPB, we are examining ways of safeguarding the Anglesey lakes. The first nutrient removal system in Wales was installed by the MoD at the RAF Valley sewage treatment works which discharges to Llyn Penrhyn. This lake, managed by RSPB, will continue to be monitored under a co-operative programme.

Two streams, Afon Goch (Dulas) and Afon Goch (Amlwch) drain the historical mining area of Parys Mountain. These are devoid of normal river life as a result of acidic and metal rich drainage from what was once the world's largest copper mine.

A Manchester University study commissioned by us, estimated that the transport of copper and zinc from Parys Mountain by the Afon Goch (Amlwch) and the Afon Goch (Dulas) amount to about 21 and 60 tonnes per year respectively. Furthermore, the export of copper and zinc to the Irish Sea from these two streams is about 5 times and 2 times respectively the cumulative load discharged by the six main rivers entering Liverpool Bay (i.e. Conwy, Dee, Mersey, Ribble, Wyre and Duddon).

Penhesgyn, near the Braint, is the only significant active landfill site on Anglesey taking putrescible waste. There is some evidence that, during the winter, ammonia concentrations are locally elevated in the Braint . However, overall concentrations are within the Long Term River Quality Objective (LTRQO). A closed landfill at Clegir Mawr is still discharging leachate which eventually enters Afon Caradog. Ammonia and BOD concentrations are locally elevated in the Caradog as a result of this discharge, though concentrations in the main river are again within the LTRQO.

Intensive chicken rearing is a feature on Anglesey with rearing farms supplying a large processing plant at Llangefni industrial estate. Holding tanks have been installed at all the farms to contain the worst of the effluent generated during cleaning out, when the potential for contamination of surface water by sawdust and chicken manure is at its greatest.

Occasional complaints are still received about the impact of these farms on local ditches although monitoring of site run-off has shown few quality problems.

Water is abstracted for public supply from Llyn Alaw and Llyn Cefni. Water quality in these two reservoirs apparently fails to meet the standards appropriate for A2 treatment. This is due to the presence of oil and grease

type compounds in the raw water. However, a persistent source of such compounds is highly unlikely at the location of the abstractions. It has been concluded that many of the "failures" are not due to polluting inputs rather an artifact of analysis in relation to the limits laid down in the Directive.

Issues Identified

Ammonia and Biochemical Oxygen Demand

Two stretches of Afon Cefni downstream from Llangefni STW fail their LTRQO of RE2. It remains to be seen whether the recent improvements at the plant will allow the river to achieve its target. If not, an interim objective will be set and negotiations will be undertaken with DCWW to decide if further improvements are required at the treatment plant. (Issue 1 Section 3.2)

There is some evidence that current operations at Penhesgyn landfill site are elevating ammonia concentrations in the Braint. The tip operators also wish to increase the height of the tip to allow a domed profile for better restoration. However, this will double the capacity and life expectancy of the site. The risks and benefits of allowing this need to be rigorously assessed, as does the environmental impact of the present operation. (Issue 2 Section 3.2)

The closed and partially capped landfill at Clegir Mawr discharges leachate through approximately 1.5 km of ditch before discharging to Afon Caradog. There is evidence that BOD and ammonia are elevated in the Caradog as a result of this discharge. The tip is built on a spring fed bog so even if an impermeable cap is installed it is likely that leachate will still be discharged. While the Caradog meets the LTRQO of RE2, the tip leachate should continue to be monitored and its effect closely studied. It may be possible to intercept the leachate for treatment. (Issue 3 Section 3.2)

Crude Sewage Discharge

Untreated sewage is discharged from a number of outfalls around the Anglesey coastline. DCWW is committed by legislation to removing all of these but not necessarily during the life of this plan. Under the requirements of the Urban Wastewater Treatment Directive (UWWTD) these crude discharges should be given appropriate treatment by 2005. The priority for improvement is subject to negotiation between ourselves, DCWW and OFWAT. (Issue 4 Section 3.2)

Private Crude Sewage Discharges

There are a number of coastal and inland, private, untreated or unsatisfactory sewage discharges. Some from small settlements, such as Wern y Wylan and Red Wharf Bay, require first time sewerage. The local authority will not now requisition sewers as they see this as the duty of the future Environment Agency and the Water Companies. However, it is not yet clear how the recent change in the legislation will be implemented and what level of investment will be available. Other private dischargers e.g. some camp sites, will need to install appropriate treatment or connect to the public system.
(Issue 5 Section 3.2)

Combined Sewer Overflows (CSOs)

There are a number of unsatisfactory CSOs or pumping station overflows such as at Trearddur Bay and Four Mile Bridge which give rise to justifiable complaints and aesthetic nuisance. Some of these require significant expenditure and may be dealt with in the current round of expenditure on CSOs as part of the DCWW investment plan for the period 1995 - 2000 (AMP2). Those improvements not included in the current round of investment will be timetabled according to their relative priority within the Regional programme. (Issue 6 Section 3.2)

Eutrophication

The impact of eutrophication results in algal blooms and threats to the conservation value of a number of SSSI lakes and reservoirs. This is a complex issue involving a number of agencies and land users. Point sources of nutrients can be controlled; however, reducing diffuse sources will require changes in land use and agricultural practices. There are also lake management options such as dredging sediments, use of barley straw etc to reduce the severity of algal blooms. (Issue 7 Section 3.2)

Metal Contamination

The adverse effects of the acid metal rich drainage from Parys Mountain means that about 12km of stream are devoid of normal life and the stream bed is covered in rust coloured iron hydroxide deposits. The discharges are a significant input of copper and zinc into Liverpool Bay. Thus this issue is whether there are cost effective measures that can be taken to ameliorate the effects of drainage. There is certainly scope for pilot studies on the use of natural reed beds for treating this polluted drainage. (Issue 8 Section 3.2)

Construction Work (A55)

The imminent construction of a new A55 dual carriageway across the Island has the potential for causing damage to watercourses, both during construction and afterwards. There is also the potential for the enhancement of habitat including wetlands. Close liaison is required at every stage of this project to ensure that risks are minimised and opportunities for improvements implemented. (Issue 9 Section 3.2)

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.

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

We have considered carefully the available surface and groundwater resources within Anglesey 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, we are satisfied that resources are adequate. As more information becomes available, for example about the actual flow requirements of the aquatic ecosystem, we will review our management of resources in each catchment.

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

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

Local Perspective

The construction of the Cefni, and later the Alaw reservoirs, with their networks of associated distribution mains, largely eliminated the island's chronic water shortage problems. As development took place, these reservoirs were further linked to the mainland via the Britannia bridge; such linking of reservoirs enabling the optimum yields of systems to be realised. At present, demands for water on Anglesey are within the capabilities of the linked resources, with any further needs being supplied from the mainland.

Issues Identified

None.

3.1.3 PHYSICAL FEATURES

General

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

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

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

Issues Identified

Conservation

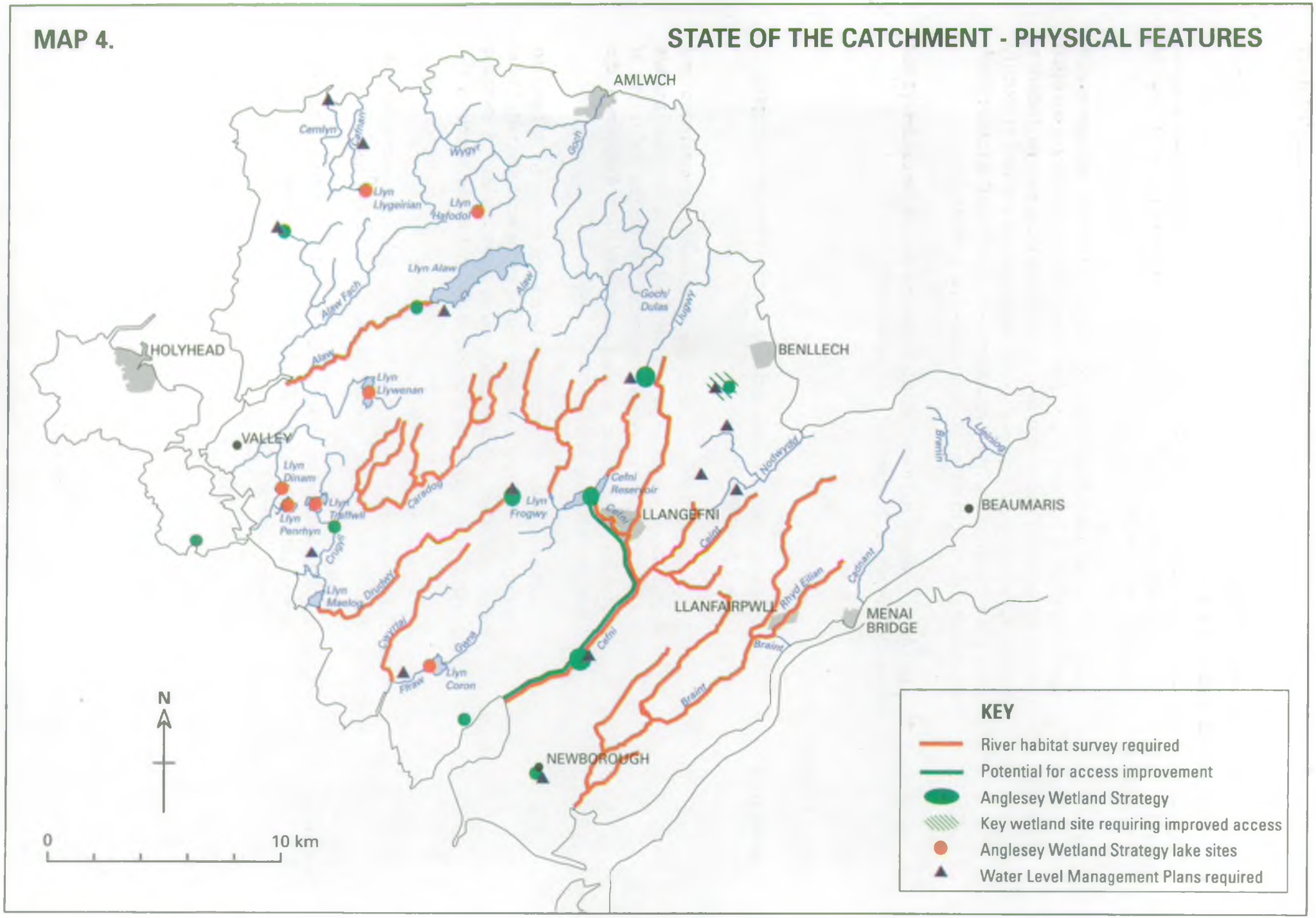
- A number of shallow lakes and reservoirs have become eutrophic. (Issue 7 Section 3.2)
- The reduction in extent and, the continuing fragmentation and degradation of wetlands, particularly reedbed and wet grassland has had a detrimental impact on wetland birds. The decline in this type of habitat has, for example, resulted in the loss from Anglesey of the bittern as a breeding bird. (Issue 10 Section 3.2)
- Significant lengths of Anglesey's rivers are perceived to have no riparian zone resulting in reduced habitat and species diversity in the river corridor and potential detriment to water quality. A strategic River Habitat Survey is required to determine the extent of the problem. (Issue 11 Section 3.2)
- There is a requirement to fully implement a NRA conservation site management plan for the Afon Cefni. (Issue 12 Section 3.2)

Recreation

- Improved access is needed along the Anglesey shoreline. The Ynys Môn coastal footpath network has yet to be completed. (Issue 13 Section 3.2)

MAP 4.

STATE OF THE CATCHMENT - PHYSICAL FEATURES



- Access to river and wetlands is poor throughout Anglesey. The potential to link Malltraeth to Llangefni along the Afon Cefni needs to be fully investigated. Public demand for access to the riverside in general needs to be determined. Only where such a demand exists will the provision of increased access be actively pursued. (Issued 14 Section 3.2)

Fisheries

- Decline in fish population of Llyn Penrhyn. (Issue 15 Section 3.2)

- Adverse effects of introduced fish species on conservation at Llynau Maelog, Dinam and Penrhyn. (Issue 16 Section 3.2)

- Late running nature of sea trout outside the current fishing season leading to loss of angling potential. (Issue 17 Section 3.2)

- Predation by cormorants on Llynau Cefni, Llygeirian and Twr. (Issue 18 Section 3.2)

- Impact of windsurfers on fishing and conservation interests on Llyn Maelog. (Issue 19 Section 3.2)

- Need to reduce the illegal exploitation of sea trout and salmon in coastal nets. (Issue 20 Section 3.2)

- Need to protect juvenile bass nursery areas. (Issue 21 Section 3.2)

Flood Defence

- There is a need to prepare Water Level Management Plans for the 11 NRA and 3 local authority operated sites identified and agreed with the Countryside Council for Wales. (Issue 22 Section 3.2)

- The Malltraeth Tidal Doors which protect 1653 ha of land, isolated farms and the village of Malltraeth from tidal inundation are in a poor condition. A capital scheme designed such that Conservation interests are not adversely affected is required to refurbish the installation. (Issue 23 Sectuion 3.2)

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 Anglesey.

Local Perspective

We have set out where significant areas of conflict have been identified within the area. Options for solving these issues are proposed in Section 3.2.

Conflicts Identified

Issue 10

Enhancement of existing wetlands. Resistance to change and mechanism of landowner compensation for decrease in agricultural production are key aspects to be resolved.

Issue 14

Improved riverside access to the Cefni between Malltraeth and Llangefni and to key wetland sites. Key areas for resolution include obtaining landowner agreement, and conflict with farmers and fishing lobby.

Issue 19

With the increase in popularity of wind surfing on Llyn Maelog the impact of the sport may conflict with the fishing and conservation Uses. A key area for resolution is the setting up of a user group to establish zones where the sport can be persued.

Issue 22

Water Level Management Plans. Resistance to change and mechanism of landowner compensation for any decrease in agricultural production are key aspects to be resolved.

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 NRA and do not constitute policy statements. We invite you to comment on these issues and options and would welcome any new ideas/suggestions that you may have.

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

In the tables of issues and options that follow, no priority has been assigned to the issues. They are listed in accordance with the current understanding of when the work, or a significant part of the work will be completed.

Abbreviations used within the tables:

CCW	Countryside Council for Wales
CLA	Country Landowners Association
CSOs	Combined Sewer Overflows
DCWW	Dŵr Cymru Welsh Water
FUW	Farmers Union of Wales
LAWDC	Local Authority Waste Disposal Company
LTRQO	Long Term River Quality Objective
MAFF	Ministry of Agriculture Fisheries and Food
NFU	National Farmers Union
NRA	National Rivers Authority
NWNWSFC	North Western and North Wales Sea Fisheries Committee
NWWT	North Wales Wildlife Trust
OFWAT	Office of Water Services
RSPB	Royal Society for the Protection of Birds
SSSI	Site of Special Scientific Interest
UWWTD	Urban Waste Water Treatment Directive
WDA	Welsh Development Agency
WO	Welsh Office

ISSUE No: 1	Two river stretches downstream from Llangefni sewage treatment works fail to meet the LTRQO of RE Class 2.		
OPTIONS	Responsibility	Advantages	Disadvantages
a) Monitor impact of recent STW improvements on river quality.	NRA	Management information to determine future action.	None, part of statutory monitoring.
b) If needed consider -			
i) Further investment at STW and identify interim river quality target.	DCWW, NRA	Compliance with RQO, interim and long term.	Cost.
ii) Environmental and cost benefit analysis of maintaining a LTRQO of RE2.	NRA	Management information to determine future action.	Cost benefit analysis may indicate LTRQO of RE3.

ISSUE No: 2	Impact of Penhesgyn landfill site on the Braint.		
OPTIONS	Responsibility	Advantages	Disadvantages
1) Continue to monitor and, agree and implement pollution mitigation methods.	NRA, Local Authority, LAWDC.	Reduce risk of pollution to Afon Braint. Earlier provision of a fully contained facility.	Cost, in particular to LAWDC.
2) If planning permission granted for an enlarged tip then incorporate pollution mitigation for the existing tip as part of the new proposals	NRA, LAWDC	Fully contained facility. Minimum pollution risk to Afon Braint.	Cost

ISSUE No: 3	Impact of Clegir Mawr closed landfill site on the BOD and ammonia levels of the Caradog.		
OPTIONS	Responsibility	Advantages	Disadvantages
1) Continue to monitor and, establish extent of impact.	NRA	Management information to determine future action.	Cost of ongoing operational monitoring.
2) If needed investigate options for pollution mitigation through leachate treatment and engineering improvements.	NRA, Ynys Môn B.C.	Determination and implementation of best method to safeguard RQO for the Afon Caradog.	Cost (>£50k)

ISSUE No: 4	Discharges of untreated sewage by DCWW to coastal waters around Anglesey.		
OPTIONS	Responsibility	Advantages	Disadvantages
Provide appropriate treatment under the terms of the UWWTD - phasing to be agreed between NRA and DCWW.	DCWW	Provide treatment for all untreated coastal sewage discharges. Enhanced public health and protection of amenity.	Cost, disruption during construction.

ISSUE No: 5	Unsatisfactory private sewage discharges.		
OPTIONS	Responsibility	Advantages	Disadvantages
1) Identify priority discharges requiring improvement and negotiate remedial action with owners.	NRA, Local Authority, Private Owners	High priority discharges addressed first. Environmental improvements.	Cost not known.
2) Identify priority needs for first time sewerage and seek inclusion in appropriate investment programme.	NRA, Local Authority, DCWW	Prioritised scheduled environmental improvements.	Cost not known.

ISSUE No: 6	Unsatisfactory CSOs and pumping station overflows.		
OPTIONS	Responsibility	Advantages	Disadvantages
Improve infrastructrue as identified in DCWW investment plan.	DCWW	Reduce complaints and aesthetic pollution.	Cost, disruption during construction.

ISSUE No: 7	Eutrophication of shallow lakes and reservoirs.		
OPTIONS	Responsibility	Advantages	Disadvantages
Carry out investigation into the impact on lake SSSIs and reservoirs.	NRA, CCW	Information to decide future action.	Cost 30k.
Evaluate possible mitigation measures and target sites for implementation.	NRA, CCW	Management information to determine future action.	Cost 60k per site.
Implementation of mitigation measures at targeted sites.	NRA, Landowners, Ynys Môn BC	Improvement in water quality, fishery and conservation value of targeted sites.	Cost not known. Some changes in land use may be required.

ISSUE No: 8	The impact of acid and metal rich drainage from historical mining on Parys Mountain on stream and sea water quality.		
OPTIONS	Responsibility	Advantages	Disadvantages
1) Chemical treatment.	NRA, WDA, Local Authorities.	Reduced copper, zinc and iron in the Afon Goch (Dulas and Amlwch) allowing stock watering and improvements in general ecology and appearance. Reduced metal inputs into Liverpool Bay.	Cost, disruption of construction. Long term maintenance. Generation of special waste for disposal.
2) Reed beds at top of system with diversion of drainage to reed bed.	NRA, WDA, Local Authorities.	As above.	As above.
3) Reed bed at tidal end of system in Dulas Bay.	NRA, WDA, Local Authorities.	As above.	As above. Alteration of Dulas Bay.
4) Do nothing.		No cost or disturbance of historic sites and protected flora.	Continued pollution.

ISSUE No: 9	Impact on the water environment of the construction of the A55 across Anglesey.		
OPTIONS	Responsibility	Advantages	Disadvantages
1) Environmental protection measures to be fully utilised in the design and construction of the road, e.g. pollution interceptors and constructed wetlands provided.	Welsh Office, Gwynedd CC, NRA, CCW, Contractors	Minimise adverse impact of the road on rivers, streams and wetlands. Creation of new or improved habitats.	Cost.

ISSUE No: 10	Decline in area and quality of wetlands due to drainage and neglect has impacted adversely on biodiversity.		
OPTIONS	Responsibility	Advantages	Disadvantages
Millenium bid for funding for wetland restoration. (Bid submitted December 1995).	NRA, RSPB, CCW, ADAS, FUW, NWWT	External funding. Existing landowners compensated for loss of production.	Cost 910k over 5 years.
Continue to implement Anglesey Wetlands Strategy.	NRA, CCW, Riparian Owners, NWWT	Sites requiring improvement are targeted.	Cost 40k per annum for 3 years.

ISSUE No: 11	Significant lengths of Anglesey rivers are perceived to have no riparian zone.		
OPTIONS	Responsibility	Advantages	Disadvantages
Carry out Strategic River Habitat Survey to quantify extent of riparian zone.	NRA	Management information - to determine future action.	Cost 5k.

ISSUE No: 12	Implementation of NRA Conservation Site Management Plan for the Afon Cefni.		
OPTIONS	Responsibility	Advantages	Disadvantages
Implement management plan.	NRA	Effective management of resource.	Cost 2k per annum.

ISSUE No: 13	Need for improved access along the Anglesey Shoreline		
OPTIONS	Responsibility	Advantages	Disadvantages
Complete the coastal footpath network for the Anglesey Coast. Part of the Ynys Môn Coastal project scheduled for completion by the end of 1997.	Ynys Môn BC	Improved access to all areas of the coast.	Cost 3K annually.

ISSUE No: 14	Poor riverside and wetland access.		
OPTIONS	Responsibility	Advantages	Disadvantages
Review the existing network and produce an agreed strategy.	Ynys Môn BC., NRA, Landowners, CCW, CLA.	Identify those areas where there is a public demand for access. Production of strategy acceptable to all relevant interested parties.	Cost not known.
If appropriate, determine a work programme for enhancing the network and associated facilities in agreement with all interested parties.	Ynys Môn BC., NRA, CCW, CLA, Landowners, Angling Clubs, FUW, NFU.	Riverside access and associated facilities meets public demand.	Cost not known.
Implement access strategy for link between Malltraeth and Llangefni.	NRA, Ynys Môn BC., CCW, Landowners, Angling Clubs, FUW, NFU	Riverside access and associated facilities consistent with agreed strategy.	Cost not known.

ISSUE No: 15	Decline in fish population of Llyn Penrhyn		
OPTIONS	Responsibility	Advantages	Disadvantages
Programme of surveys to establish fish numbers and the species present.	NRA, Riparian Owner	Management information to determine further actions.	Cost 5k.

ISSUE No: 16	Impact of introduced fish species on conservation interests at Llynnau Maelog, Dinam and Penrhyn		
OPTIONS	Responsibility	Advantages	Disadvantages
Assessment of current population.	NRA, CCW, Riparian Owner	Establish facts.	Cost 5k.
Prevent introduction of unwanted species.	NRA, (S.30 Salmon and Freshwater Fisheries Act).	Existing regulations.	Difficult to achieve full compliance. Illegal stocking.

ISSUE No: 17	Late running nature of sea trout in relation to the fishing season.		
OPTIONS	Responsibility	Advantages	Disadvantages
Review existing experimental extension to fishing season (up to November 17th).	NRA	Management information to determine future action.	Cost 5k.
If viable extend season.	NRA	Increased angling opportunity and additional licence income.	Over exploitation and potential taking of unclean fish.

ISSUE No: 18	Predation of fish by cormorants in Llynnau Cefni, Llygeirian and Twr.		
OPTIONS	Responsibility	Advantages	Disadvantages
Await outcome of ongoing study being carried out by MAFF.	MAFF	No additional expenditure or duplication of work effort.	Possible delay in implementation of strategy.
Assess impact at specific sites where culling licence application has been made.	MAFF, CCW, NRA, Owner	Consensus decision	Shortage of good quality data. Cost of providing good data in the future.

ISSUE No: 19	The impact of windsurfers on fishing and conservation interests on Llyn Maelog.		
OPTIONS	Responsibility	Advantages	Disadvantages
Establish user group to set up use zones.	Ynys Môn BC., CCW, NRA.	Management by consensus.	Cost not known.

ISSUE No: 20	Reduce the illegal exploitation of sea trout and salmon in coastal nets.		
OPTIONS	Responsibility	Advantages	Disadvantages
Review the NWNWSFC byelaws.	NWNWSFC, NRA	Improved regulations could prevent abuse.	Cost not known.
Undertake research into the abundance of sea trout and level of catches throughout the season.	NRA	Increased knowledge. Meets the recommendations of the National Sea Trout Project .	Cost not known.

ISSUE No: 21	Need to protect juvenile bass nursery areas.		
OPTIONS	Responsibility	Advantages	Disadvantages
Review the efficiency of bass conservation measures in Anglesey waters.	MAFF	Promote conservation of bass stocks. Good PR.	Cost not known.

ISSUE No: 22	To prepare Water Level Management Plans for 11 NRA and 3 Ynys Môn B.C. operated sites.		
OPTIONS	Responsibility	Advantages	Disadvantages
Prepare plans for all sites where landowner is in agreement.	NRA, Landowners, CCW, WO, NWWT, RSPB, Ynys Môn B.C.	Working document to manage for conservation/ agriculture.	Cost. Lack of compensatory mechanism. Hydrological data required.
Implement those plans where landowners are in agreement.	NRA, Landowners	Effective management of site.	Cost.
Prepare plans for sites where there is Landowner resistance.	NRA, Landowners, CCW, WO, NWWT, RSPB, Ynys Môn B.C.	Working document to manage for conservation/ agriculture.	Cost. Lack of compensatory mechanism. Hydrological data required.
Implement plans (2nd phase) as Landowner agreement is obtained.	NRA, Landowners	Effective management of site.	Cost.

ISSUE No: 23	Refurbishment of Malltraeth Tidal Doors.		
OPTIONS	Responsibility	Advantages	Disadvantages
Undertake a Capital Scheme to reconstruct the tidal doors.	NRA	Maintain the existing level of protection from tidal flooding.	Cost - the scheme will be subject to cost benefit analysis to satisfy Welsh Office grant aid rules.

PART II

SUPPORTING INFORMATION

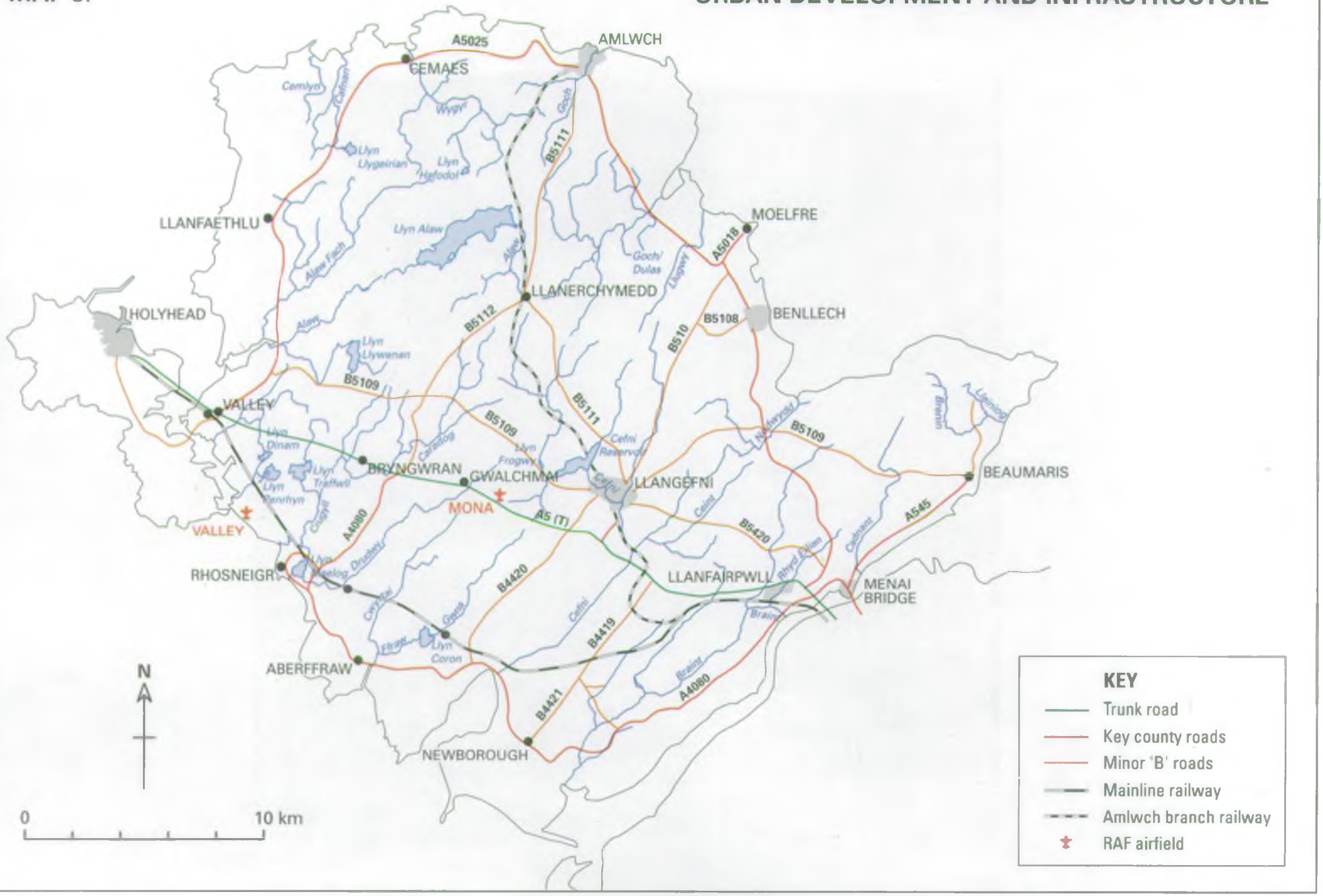
4.0 THE USES OF THE ANGLESEY CATCHMENT

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

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

MAP 5.

URBAN DEVELOPMENT AND INFRASTRUCTURE



4.1 URBAN DEVELOPMENT (including road and rail)

General Information

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

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

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

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

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

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

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

Local Perspective

Ynys Môn is a Borough Council of the County of Gwynedd with its administrative centre located in Llangefni at the heart of the Island. This will however become a Unitary Authority from 1st April 1996 following Local Government reorganisation in Wales.

The Gwynedd Structure Plan was adopted in 1993 and the Ynys Môn Local Plan has recently been the subject of an Examination in Public (E.I.P.). The Inspector's report is currently being considered by the council. The Local Plan makes provision for the expansion of industrial premises at Holyhead, Mona, Amlwch, Gaerwen, Rhosgoch and Llangefni. Much of the Island's housing requirement can be satisfied by sites with current planning consents, although new land allocations have been proposed in Amlwch, Holyhead and Llangefni.

TABLE A **CURRENT STATUS OF DEVELOPMENT PLANS WITHIN THE PLAN AREA**

ADMINISTRATIVE COUNCIL	DEVELOPMENT PLAN STATUS
Gwynedd County Council	Structure Plan adopted 1993.
Ynys Mon Borough Council	Deposit Plan subject to public inquiry. Inspectors report currently being considered by the council.

We are currently formally objecting to any further development that would place an additional load to the public sewerage systems serving Holyhead, Rhosneigr, Moelfre and Cemaes. Foul drainage from these communities is discharged untreated to coastal waters resulting in the deposition of sewage derived material along the foreshore. Although sewage treatment facilities will eventually be provided by Dŵr Cymru Welsh Water, there has been no commitment for improvements to be implemented within the short term. As such, it is considered that further development can only exacerbate an already unsatisfactory situation. In view of the proposal to allocate development land in Holyhead, we have also registered a formal objection to the Local Plan.

Both the Structure Plan and Local Plan make provision for a new dual carriageway A55 across the Island. This scheme has been given priority in view of the road status as an international Connections Route. A significant expansion to the port at Holyhead is currently under construction, and there are plans to upgrade the Amlwch branch railway line (between Gaerwen and Amlwch) to passenger carrying status.

Aims

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

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

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

Environmental Requirements:

Water Quality

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

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

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

Water Quantity

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

Physical Features

Development should not have an unacceptable flood risk.

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

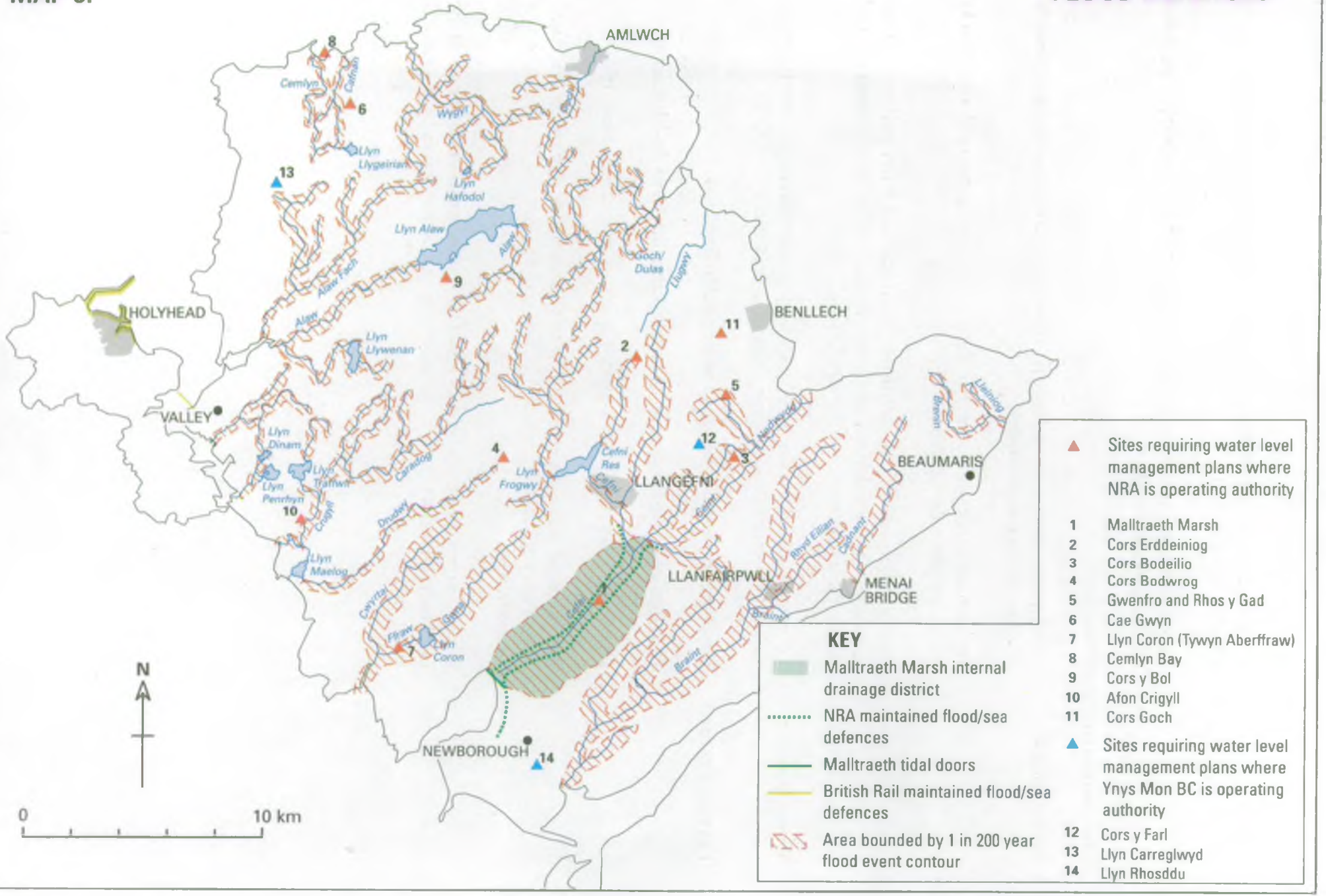
Developers must pay for work needed to assess and reduce flood risk.

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

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

MAP 6.

FLOOD DEFENCES



KEY

- Malltraeth Marsh internal drainage district
- NRA maintained flood/sea defences
- Malltraeth tidal doors
- British Rail maintained flood/sea defences
- Area bounded by 1 in 200 year flood event contour

- ▲ Sites requiring water level management plans where NRA is operating authority
  - 1 Malltraeth Marsh
  - 2 Cors Erddeiniog
  - 3 Cors Bodeilio
  - 4 Cors Bodwrog
  - 5 Gwenfro and Rhos y Gad
  - 6 Cae Gwyn
  - 7 Llyn Coron (Tywyn Aberffraw)
  - 8 Cemlyn Bay
  - 9 Cors y Bol
  - 10 Afon Crigyll
  - 11 Cors Goch
- ▲ Sites requiring water level management plans where Ynys Mon BC is operating authority
  - 12 Cors y Farl
  - 13 Llyn Carreglwyd
  - 14 Llyn Rhosddu

4.2 FLOOD DEFENCE

General Information

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

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

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

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

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

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

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

The Water Resources Act 1991 requires the NRA to exercise general supervision over all matters relating to flood defence. Powers are also

provided for the issue of consents for works on rivers and watercourses designated as Main River and for ensuring the maintenance of flow in river channels and the removal of obstructions.

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

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

Water Level Management Plans will be drawn-up for sites agreed with the Coutryside Council for Wales and/or English Nature in accordance with the guidance issued by MAFF/Welsh Office.

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

Within Anglesey, the necessary powers to maintain or improve sea and tidal defences are shared by ourselves and Ynys Môn District Council. The presence of development within the coastal plain has generated a commitment to the provision of adequate sea defences by the District Councils. There are also lengths of defence in private ownership, some of British Rail, e.g. Port of Holyhead and Stanley Embankment (Valley - Holyhead). The type of sea defence varies between natural dune systems and the traditional concrete sea wall/promenade of a seaside town, (e.g. Trearddur Bay) and there are also earth banks.

The tidal defences within the low lying areas of the Afon Cefni (Malltraeth Marsh) are earth embankments maintained by us. Malltraeth Marsh itself is drained via two side drains with outfalls into the Afon Cefni estuary through our owned and maintained structure - Malltraeth Tidal Doors. These also protect the low lying Malltraeth Marsh from tidal inundation.

The Tidal Doors are in poor condition and a capital scheme is being prepared to refurbish the installation. The scheme will need to satisfy Welsh Office project appraisal guidelines to attract grant aid.

The existence of extensive areas of flood and coastal plains and low-lying land presented drainage difficulties. This led to the formation of Internal Drainage Boards and the classification of low-lying protected land as being within the Internal Drainage District. In the North Wales we are the Internal Drainage Boards. In the Ynys Môn Catchment there is only one IDD namely the Malltraeth Marsh IDD.

The effectiveness of these IDDs is dependent on regular and intensive maintenance of the main rivers and adopted ditches within the system. Also regular inspection and maintenance of the tidal flaps through which the IDD's drain, and inspection and maintenance of the floodbanks is required.

Elsewhere in the catchment flood defence work consists mainly of deweed/desilt operations and river maintenance schemes carried out on a projective 5-10 year return period. Our maintained culverted outfalls to the sea are also included for maintenance and refurbishment as necessary. River outfall training is also considered where tidal influences are strong.

There are no major flooding problems on the `main rivers' within the catchment, although large areas of agricultural land within the flood plains are inundated from time to time. However, limited incidents associated with ordinary river systems have been recorded.

There are 14 sites within the Ynys Môn CMP which have been designated as sites for Water Level Management Plans (WLMP) (see Map 6). The WLMP strategy is at the present time still under consideration with statutory consultees e.g. CCW. It is hoped that when this strategy has been fully developed all "conservation linked schemes" will comply with the WLMP.

There is no formal flood alert monitoring station on Anglesey. Although this would appear to be at odds with our policy, local conditions are such that the absence of a flood warning system is not considered an issue for this area.

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.

The operating practices agreed in Water Level Management Plans will be followed.

4.3 SOLID WASTE DISPOSAL (LANDFILL)

General Information

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

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

Local Perspective

The main waste disposal site on Anglesey, located at Penhesgyn, Cwm Cadnant, is operated by Cwmni Gwastraff Mon-Arfon Cyf. This is a private company set up by Ynys Mon and Arfon Borough Councils to receive waste according to the requirements of the Environmental Protection Act 1990. It can take waste from either of the Council's areas but predominantly serves Ynys Mon. The site has been in operation since the 1950s and is operated on the dilute and disperse principle. The possible contamination by leachate of groundwater and the nearby watercourse, the Afon Braint, is the subject of a detailed monitoring programme. This involves taking surface water and borehole samples located within, and surrounding the site according to the Waste Management Licence for the site. This site is nearing capacity and the company has plans to construct a new tip adjacent to the present site. We have stipulated that the new area must be operated on a containment basis, which will require the site to be lined with an impermeable barrier. A high quality civic amenity site is open seven days a week at Penhesgyn for the public to deposit waste.

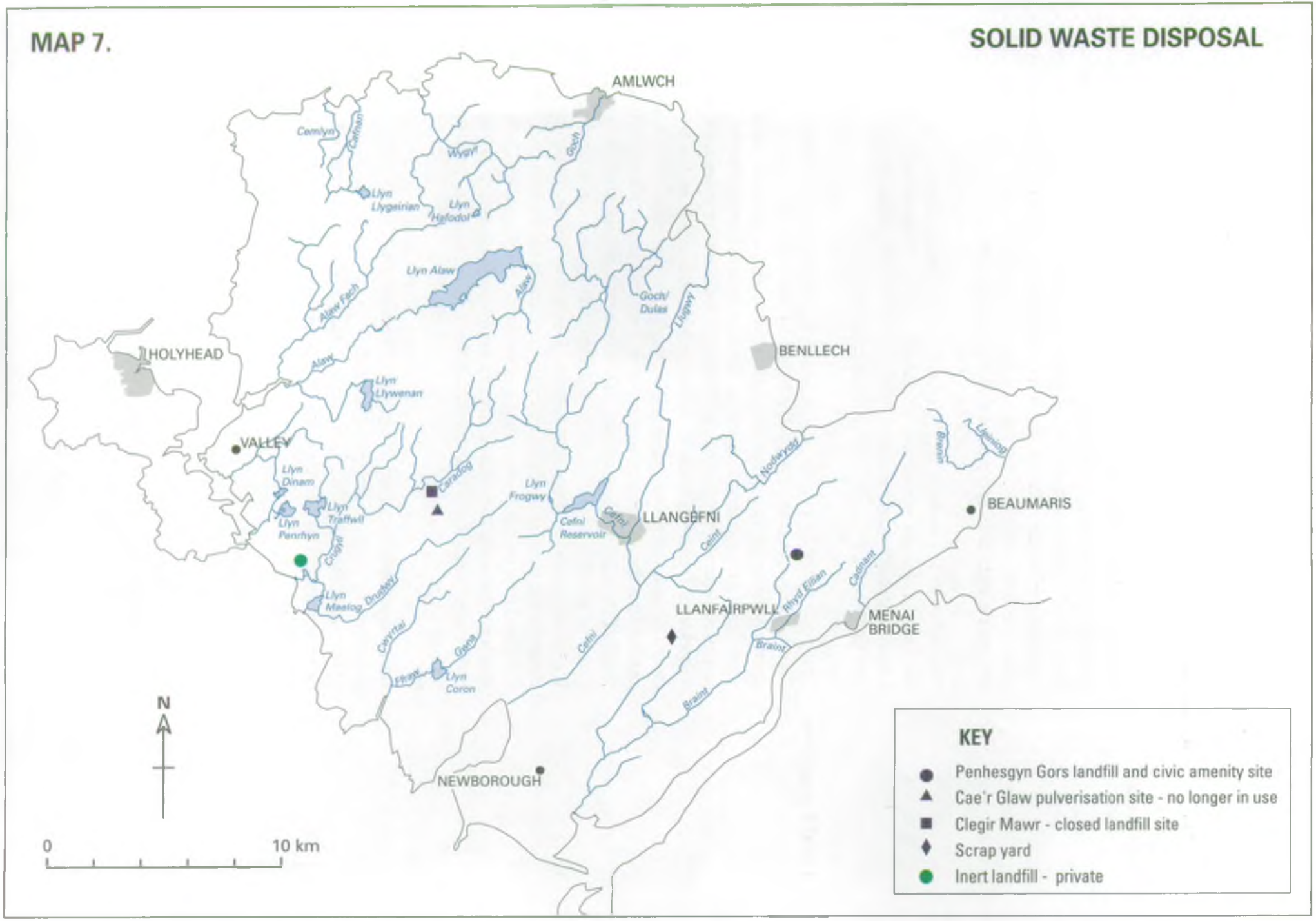
Domestic waste taken to Penhesgyn between 1986 and 1992 was first processed by a pulverising plant at Cae'r Glaw, Gwalchmai. This was built using money from the EEC with the aim of reducing the volume of the waste being dumped. This plant is not in use at present as it proved not to be cost effective.

A quarry, operated by ARC, on land adjacent to the Cae'r Glaw pulveriser is currently being used as a waste transfer station for road building material.

The Clegir Mawr site at Gwalchmai, received domestic and trade waste until its closure in 1989. The site is still the responsibility of Ynys Môn Borough Council and was operated as a dilute and disperse site. A low permeability

MAP 7.

SOLID WASTE DISPOSAL



cap to reduce the production of leachate and boreholes to vent gas were put in place in the early 1990s. This site continues to be a possible source of pollution to the nearby watercourse, the Afon Caradog which we monitor regularly.

Phoenix Metals & C Davies Non-Ferrous Metal is a private company operating a metal recovery scrapyard, situated on the Gaerwen Industrial Estate. This is subject to a Waste Management Licence which requires monitoring of surface water drainage which passes through a large interceptor.

Aims

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

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

Environmental Requirements:

Water Quality

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

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

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

Water Quantity

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

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

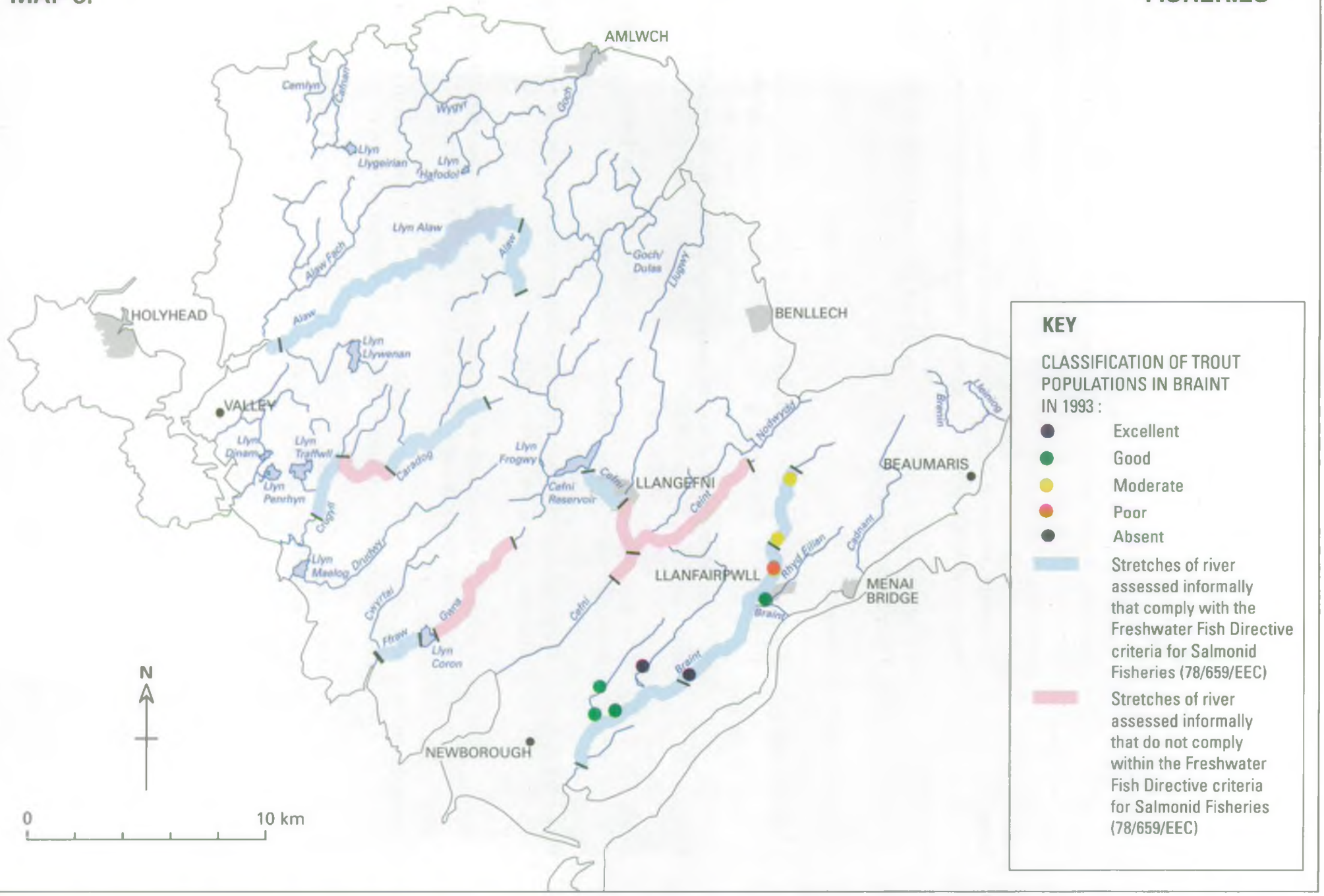
Physical Features

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

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

MAP 8.

FISHERIES



KEY

CLASSIFICATION OF TROUT POPULATIONS IN BRAINT IN 1993 :

- Excellent
- Good
- Moderate
- Poor
- Absent

Stretches of river assessed informally that comply with the Freshwater Fish Directive criteria for Salmonid Fisheries (78/659/EEC)

Stretches of river assessed informally that do not comply within the Freshwater Fish Directive criteria for Salmonid Fisheries (78/659/EEC)

The fish populations in Anglesey rivers are dominated by two main species, the trout and the eel. All Anglesey rivers and streams are accessible to sea trout and it is likely that the progeny of sea trout form the bulk of the freshwater trout populations. All rivers apart from the Afon Goch have trout present. Other species present in the rivers are sea lamprey, brook lamprey, river lamprey, minnow, three spined stickleback, ten spined stickleback and rudd. The latter are restricted to the section of river between Cefni Reservoir and Llangefni.

Anglesey has many lakes, both natural and artificial. Although the natural freshwater fish fauna is relatively impoverished, many species of coarse fish have been introduced. During the last hundred years roach, perch, tench, bream, common carp, crucian carp and mirror carp have all become well established. In addition pike were recorded in Anglesey waters in 1994.

No salmon were recorded in electrofishing surveys carried out in 1994; however trout were locally abundant.

In recent years eutrophication has been identified as a problem affecting some Anglesey still waters. Coarse fish are better adapted to increasing eutrophication and they have flourished at the expense of game fish. However, at Llyn Penrhyn eutrophication is thought to have been a contributory factor to the reduction in both game and coarse fish populations. A survey of the fish populations at Llyn Penrhyn and Llyn Dinam is currently being carried out.

Sea and estuarine fish such as mullet, flounder and bass are locally abundant and support recreational fisheries in estuaries throughout Anglesey.

The control of poaching is a vital aspect in the conservation of fish stocks and we undertake enforcement work on both the coastal and inland waters of Anglesey. Much of the coast of Anglesey is frequented by migratory sea trout and salmon. Therefore, monitoring of netting activity and checks on nets around the Anglesey coast is an important part of the enforcement work. Very few sea trout enter Anglesey rivers until the end of September. From then, until spawning is completed in December, protection is required to safeguard the fish as they return to the narrow but vulnerable spawning areas.

Aim

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

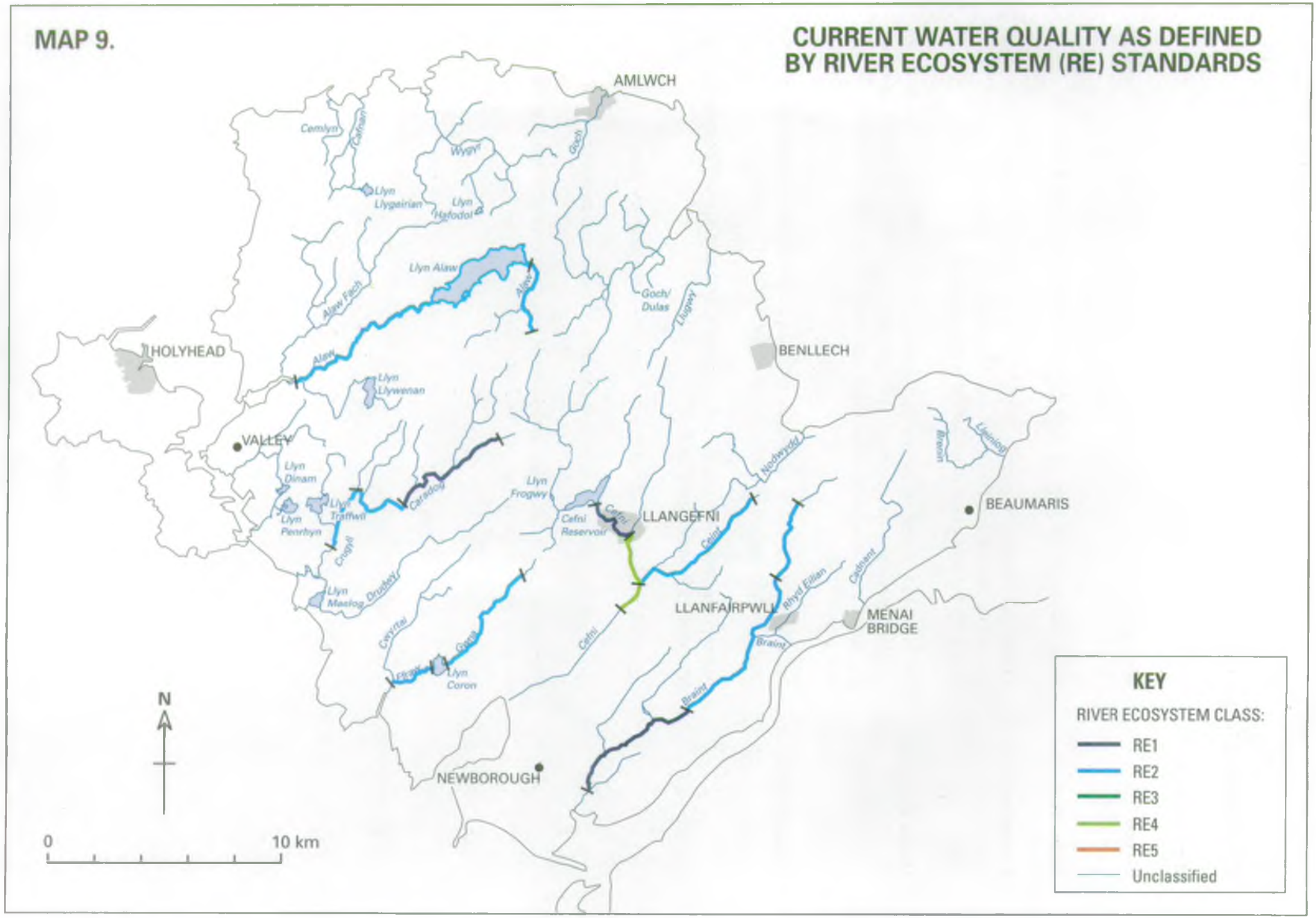
Environmental Requirements:

Water Quality

Rivers	Waters should comply with the appropriate standards under the EC Freshwater Fish Directive (78/659/EEC).
Stillwaters	These waters should comply with the same standards as set for rivers.
Estuaries	These waters should comply with the appropriate standards of the EC Dangerous substances Directive and the appropriate standards in the NRA policy for the protection of estuarine water quality.
Water Quantity	The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.
Physical Features	An appropriate diversity of natural instream and bankside habitats should be maintained to support the fish typical of the river type. Appropriate levels of riparian and instream vegetation should be maintained to provide adequate cover for fish. Artificial barriers should not obstruct passage of migratory fish. Natural 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 9.

CURRENT WATER QUALITY AS DEFINED BY RIVER ECOSYSTEM (RE) STANDARDS



4.5 RIVER ECOSYSTEM

General Information

The River Ecosystem (RE) Use addresses the protection, maintenance and improvement of the basic water quality required to support different types of river ecosystem (including fisheries). The Use is based on the River Ecosystem Classification Scheme which comprises five classes of water quality of which RE Class 1 has the highest quality.

RE Class 1: Water of very good quality (suitable for all fish species)

RE Class 2: Water of good quality (suitable for all fish species)

RE Class 3: Water of fair quality (suitable for high class coarse fish populations)

RE Class 4: Water of fair quality (suitable for coarse fish populations)

RE Class 5: Water of poor quality (which is likely to limit coarse fish populations)

Further details of the scheme may be found in Surface Waters (River Ecosystem) (Classification) Regulations 1994.

This scheme is especially useful for setting objectives which we use as planning targets to manage catchment water quality (see section 5.1).

Local Perspective

The map shows the River Ecosystem Class for the classified stretches on Anglesey using the last three years data 1992 - 1994. Apart from that stretch of Afon Cefni which receives the discharge from Llangefni STW, all other stretches are achieving or exceeding their long term River Ecosystem Class. It is expected that when the latest round of improvements are implemented at Llangefni STW, the Cefni should also achieve at least RE 2 for the whole of its length. However, since dilution is low (1.2:1 for Llangefni effluent) high quality effluents will be required from both Llangefni and Gaerwen STW's in order to reliably achieve this long term objective. It will therefore be necessary to monitor the success of the latest improvements at Llangefni STW.

Aim

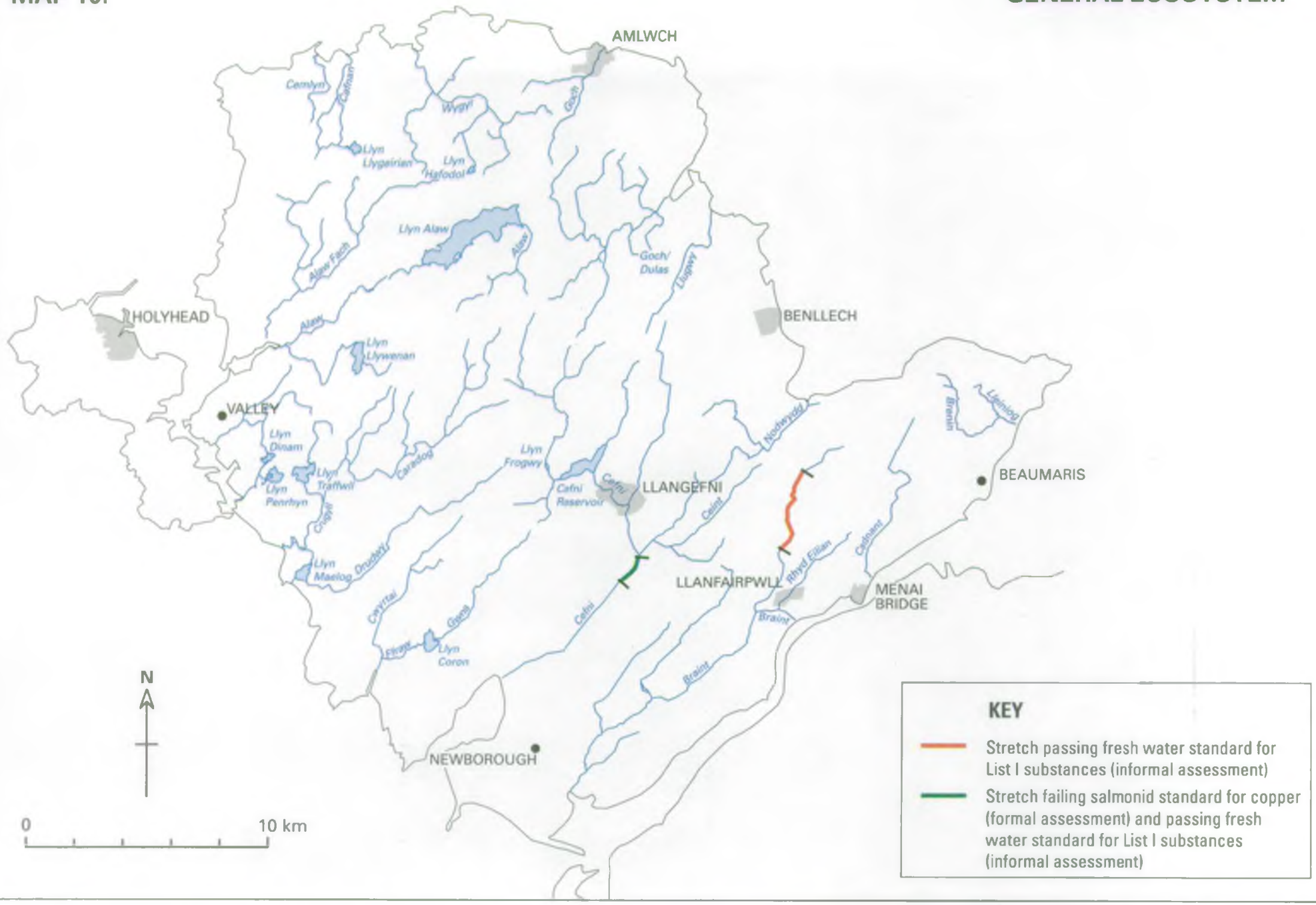
To provide water quality suitable to support a healthy River Ecosystem appropriate to the type of river.

Environmental Requirements:

Water Quality	Waters should comply with the appropriate standards, applied formally or informally, under the Surface Waters (River Ecosystem) (Classification) Regulations 1994.
Water Quantity	The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.
Physical Features	An appropriate diversity of natural instream and bankside habitat should be maintained to support the Ecosystem typical of this river type.

MAP 10.

GENERAL ECOSYSTEM



4.6 GENERAL ECOSYSTEM

General Information

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

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

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

Local Perspective

There are no consented discharges of EC Dangerous Substances Directive list 1 substances on Anglesey. The two reaches that had their water quality assessed on an informal basis against the standards for fresh water both complied. Only the discharge from Llangefni STW is consented for List II substances. Analysis of data from Pont y Gors on Afon Cefni showed a failure to comply with standards for copper in 1992. This was caused by one high value and probably resulted from an unauthorised discharge to sewer which passed through the sewage treatment works.

Aim

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

Environmental Requirements:

Water Quality

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

Water Quantity

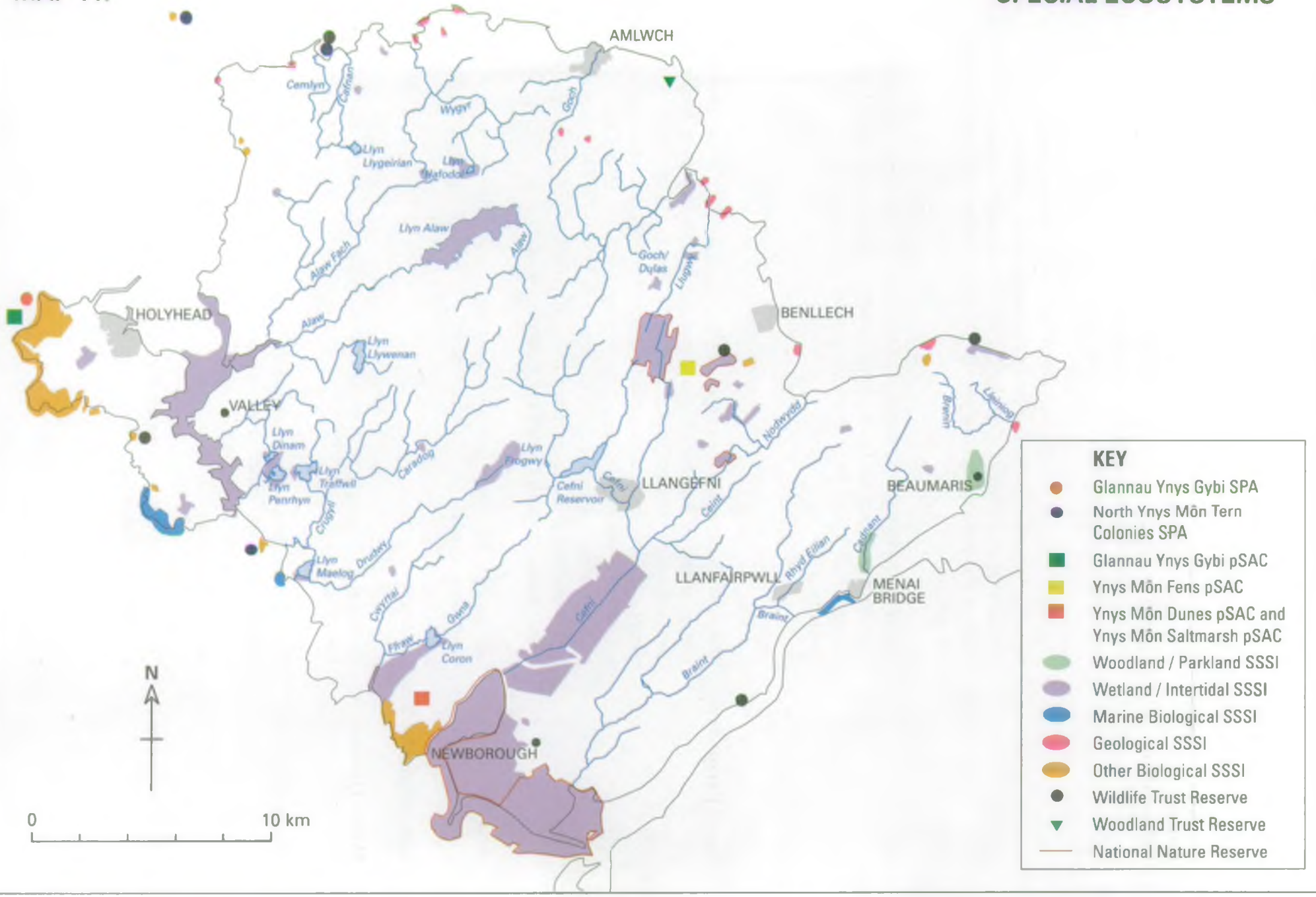
The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.

Physical Features

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

MAP 11.

SPECIAL ECOSYSTEMS



4.7 SPECIAL ECOSYSTEMS

General Information

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

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

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

Local Perspective

Within Anglesey there are 58 Sites of Special Scientific Interest (SSSIs) of which 5 have National Nature Reserve (NNR) status over part of the site. In addition, 3 SSSI's have been designated a Special Protection Area (SPA) under the EC Birds Directive for coastal birds, and 4 Special Areas of Conservation (SACs) are proposed under the EC Habitats Directive.

Wetland sites: fen, open water, swamp and wet grassland form a relatively high proportion (71%) of sites protected for biological reasons.

Rich fen communities associated with basic inputs from limestone are predominant in eastern Anglesey and characterised by ancient lake sites such as Cors Goch, Cors Erddreiniog and Cors Bodeilio. Acid fen communities tend to be more westerly, on poor soils in river valleys, characterised by Cors Bodwrog and Cors y Bol.

Most of these sites have been modified by drainage, and predominant vegetation types reduced in extent or fragmented. Swamp communities which depend on standing water have been particularly damaged. Studies by RSPB have demonstrated that 38% of reed bed sites have decreased in size over the last 10 years with the loss of the bittern as a breeding bird on Anglesey. Open waters are represented at 16 protected sites, notified for their macrophyte assemblages and wildfowl interest (particularly tufted duck, gadwall, pochard and shoveler). Enrichment from sewage and agricultural inputs has led to eutrophication in some lakes. The coastal zone includes large areas of protected habitats, particularly Newborough Warren and Tyddyn Aberffraw sand dune systems, but also mudflats, marine reefs, sea cliffs and estuary.

Lowland wet grassland is most extensively represented along the flood plain of the Afon Cefni (Malltraeth Marsh SSSI). Separation of the upland and lowland carriers by canalisation and embankments has resulted in a lowland ditch system requiring our regular maintenance. Nevertheless, these watercourses support a rich macrophyte flora and we have recently completed a project which successfully restored the wildlife interest of much of the remnants of the original watercourse (Hen Afon Cefni). Although notified for its breeding wader interest, lapwing numbers had fallen by 82% and redshank by 75% between 1985 and 1993. The NRA owns the freshwater and coastal embankments and associated land and we are currently implementing a management plan for the site.

Part of the site (Morfa Mawr, 150ha) has been purchased by RSPB and is under conservation management with the aim of restoring reedbed and wet grassland habitats. This work is part of a wider initative between CCW, RSPB and ourselves to promote conservation, education and access - the Anglesey Wetlands Strategy. Current and proposed work on 34 sites includes hydrological and topographical surveys, vegetation management, water level control and improved access and interpretation. This will be further consolidated by the implementation of full Water Level Management Plans up to 1998.

There are over 20 stillwaters on Anglesey and many of these are SSSIs or of local nature conservation interest because of the plant and bird life they support. Most of these lakes are nutrient rich (eutrophic) because of phosphate and nitrate from agriculture or centres of population. This gives rise, particularly in hot summers, to algal blooms of nuisance proportions. This sometimes causes fish kills and reduces aquatic plant diversity, threatening the long term conservation importance of some lakes.

As part of the Anglesey Wetlands Strategy water quality investigations into the nutrient status of Llynnau Dinas, Penrhyn, Coron, Maelog, Llywenan, Llygeirian, and Llyn yr Wyth Eidion are being carried out. It is hoped that a better understanding of these lakes will result and management options for the future be identified.

Already, at Llyn Penrhyn which receives a point source of nutrients from RAF Valley sewage works, the Ministry of Defence has installed nutrient removal facilities which have been operational for over a year. It remains to be seen what long term influence this will have on the ecology of the lake. Clearly, where nutrient input is from diffuse sources such as land run-off, the management options for reducing nutrient input will not be so straightforward.

Aim

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

Environmental Requirements:

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

Water Quality

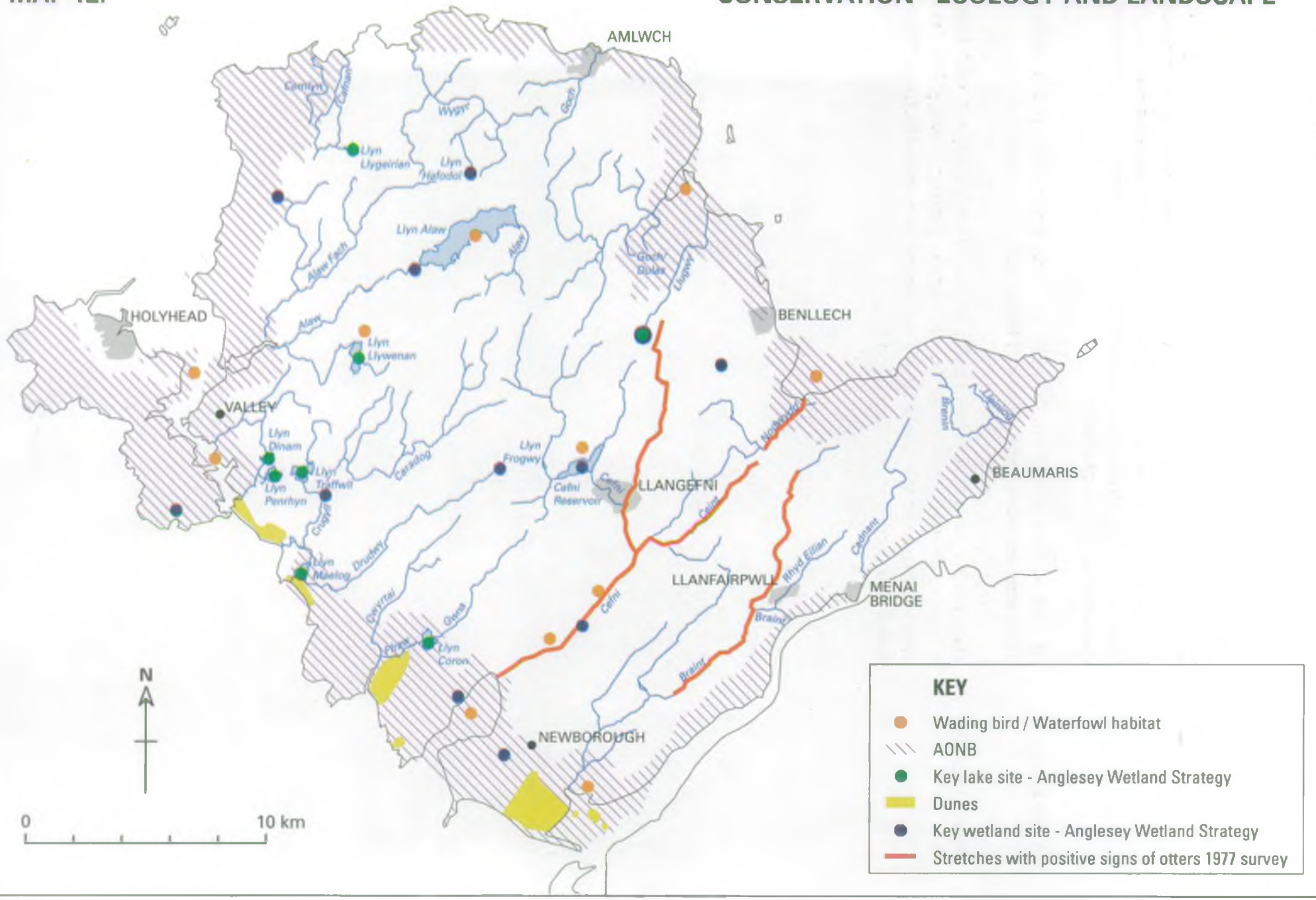
At sites where water quality is a key factor in the protection of a special ecosystem, appropriate standards will be applied.

Water Quantity

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

MAP 12.

CONSERVATION - ECOLOGY AND LANDSCAPE



4.8 CONSERVATION OF NATURE, LANDSCAPE AND HERITAGE

General Information

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

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

We have a duty to promote and further conservation of flora and fauna 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 National Parks or as Areas of Outstanding Natural Beauty (AONBs), for which we are an informal consultee.

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

Local Perspective

The coastal zone of Anglesey consists primarily of either pre Cambrian or Carboniferous limestone rock outcrop associated with coastal heath, coastal grassland and hardcliff coastal types, to the north and west.

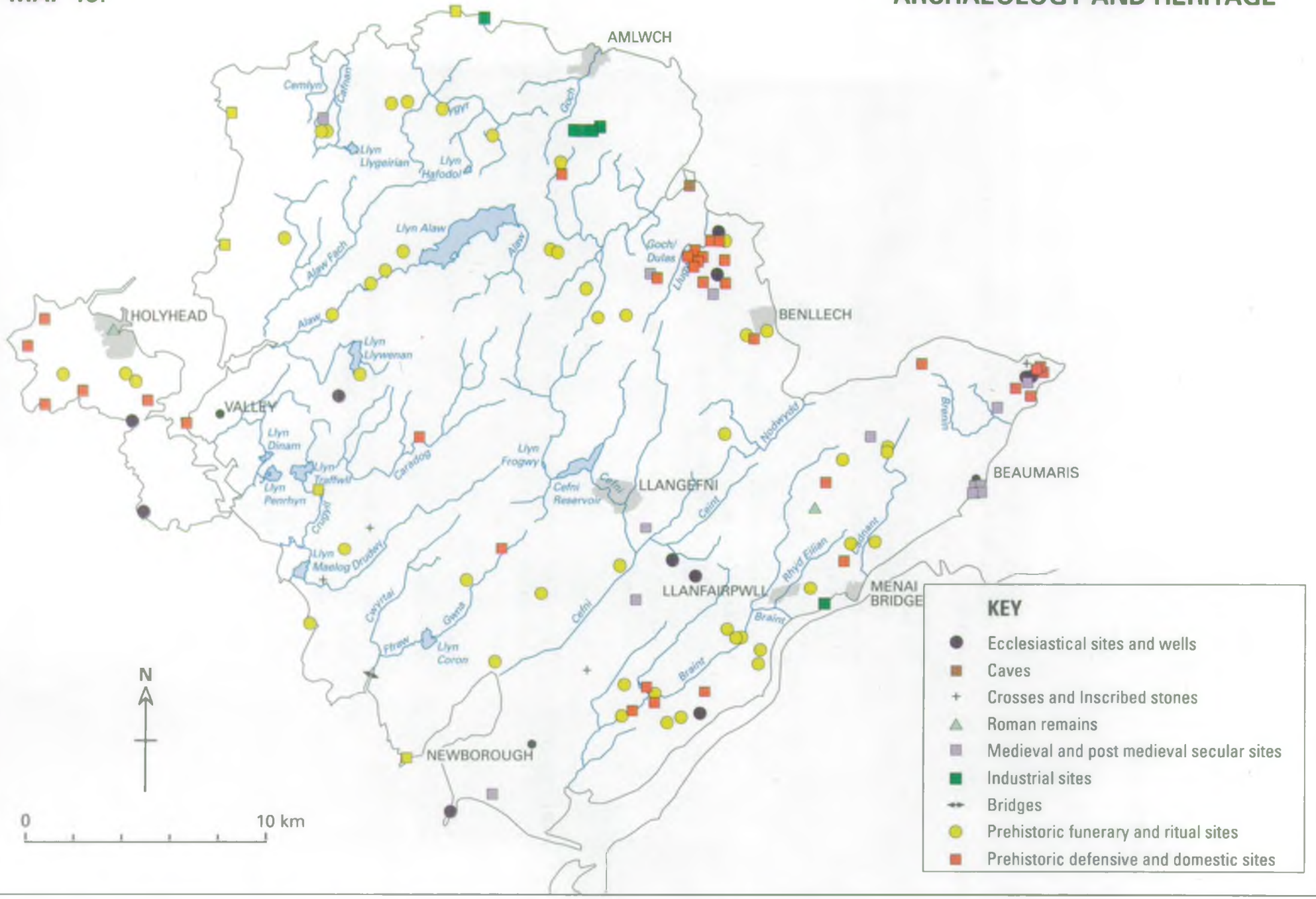
The south west of the island is largely sand dune interspaced with igneous intrusions.

Drainage across the island generally occurs in a southwesterly direction outflowing in the estuaries of the Cefni, Braint and Alaw. Saltmarsh and mud and sand are the primary coastal types.

The rivers are typically short, narrow and low gradient. Nutrient rich, alkaline water flowing over a largely silt bed results in a greater productivity than that found on the mainland with extensive macrophyte growth on low flow sections requiring regular maintenance. *Sparganum erectum* is the predominant emergent here with *Myriophyllum* and *Ranunculus species* growing in the faster flowing gravel sections.

MAP 13.

ARCHAEOLOGY AND HERITAGE



Most of the lakes and wetlands are of SSSI status although many snipe bogs and remnants of floodplain mires damaged by drainage, occur throughout the island.

River and wetland bird populations are poor. Riverine species such as kingfisher, dipper and common sandpiper are restricted by habitat and geomorphology, whilst wet grassland species such as lapwing, snipe and redshank continue to decline.

The quality of riparian habitat is also generally poor, most main rivers are regularly maintained, lack trees and adjacent land is often improved to the water's edge. The absence of a river corridor is significant across much of Anglesey, and has undoubtedly played a part in the decline of the otter which in the early part of the century was reported as "doing very well on Anglesey". By the late 1970s, signs of otters were found at only 14% of 58 sites, less than 10 years later, this figure had reached zero and this was still the case in 1991. NRA policy states that investment to protect and improve conditions for otters should only occur on river catchments that are near to otter population strongholds and that are suitable for recolonisation. Neither of these criteria apply to Anglesey rivers, instead the NRAs "Conservation Strategy for Otters in Wales" requires a "watching brief" to be maintained.

The designation of Anglesey as an Environmentally Sensitive Area (ESA) reflects the mosaic of improved and semi - improved farmland interspersed with open, semi-natural vegetation, rock outcrops, traditional field patterns and farm buildings. Broadleaved and coniferous woodland (except Newborough Warren) is relatively infrequent on the island and semi-natural woodland is scarce. In this protected landscape, the development of windfarms in exposed areas has become a particular issue.

Other environmental impacts include agricultural drainage (past and present) leading to intensification, increased nutrient inputs to watercourses and decline in diversity, construction of the new A5 and damage to fragile coastal habitats.

There are 124 SAMS within the catchment and a wealth of other archaeological evidence, the earliest of which, such as the scatter of flint tools found on the headland west of Aberffraw, date back some 8,000 years.

Evidence from throughout the ages is found around the coast - the neolithic burial chambers and standing stones of the west coast; the forts and hill forts such as Caer-y-Twr; the Roman fortification at Caer Gybi; the Norman castle at Aberlleiniog and the Edwardian town and castle of Beaumaris.

Perhaps the most significant human impact has been the gradual deforestation and agricultural improvement such as the draining of the Malltraeth marshes but there is also industrial archaeology of considerable importance, the copper mines of Mynydd Parys having been the largest in the world in the late 18th century.

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

Environmental Requirements:

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

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

Physical Features Physical features that give rise to natural beauty should be protected.

Sites and buildings of interest should, where cost-effective, be protected from damage by flooding and/or drought.

4.9 ABSTRACTION

General Information

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

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

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

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

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

Private and Public Water Supply

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

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

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

Spray Irrigation

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

Water Transfer

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

Industry

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

Amenity

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

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

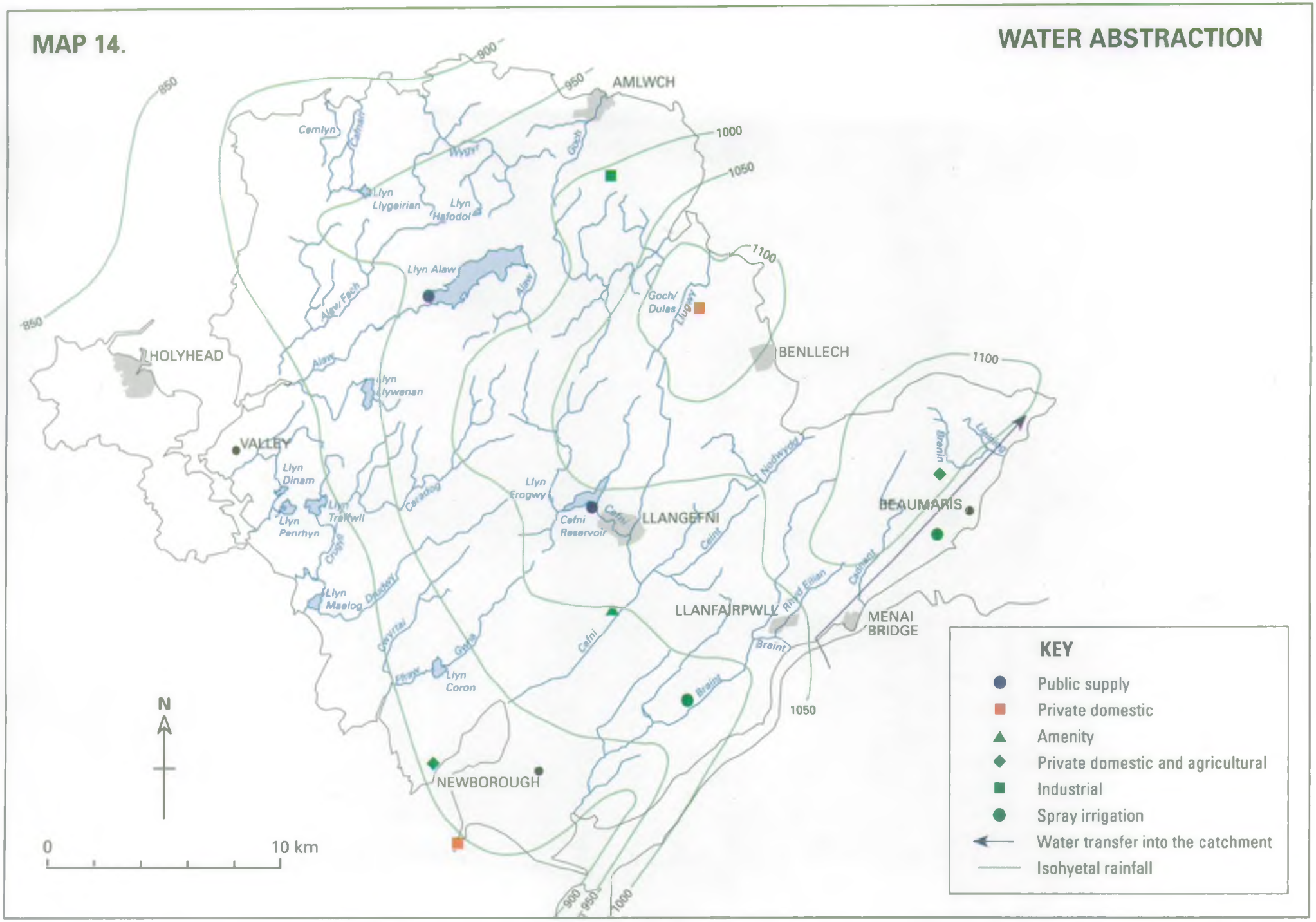
Ponds created by the damming of a watercourse will generally require an impounding licence.

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

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

MAP 14.

WATER ABSTRACTION



Local Perspective

Since the island is heavily reliant on mains water there are very few licensed abstractions which fall into any of the above categories. Some use is still made of wells and springs but these in general do not require licensing. DCWW is licensed to abstract 14112.4Ml/a from its two reservoirs, this forming the vast bulk of abstractions on the island. Very small takes for amenity, private domestic and industrial are licensed.

Aims

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

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

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

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

Agricultural/Spray Irrigation

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

To encourage winter storage abstraction for use in summer.

Environmental Requirements:

Water Quantity

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

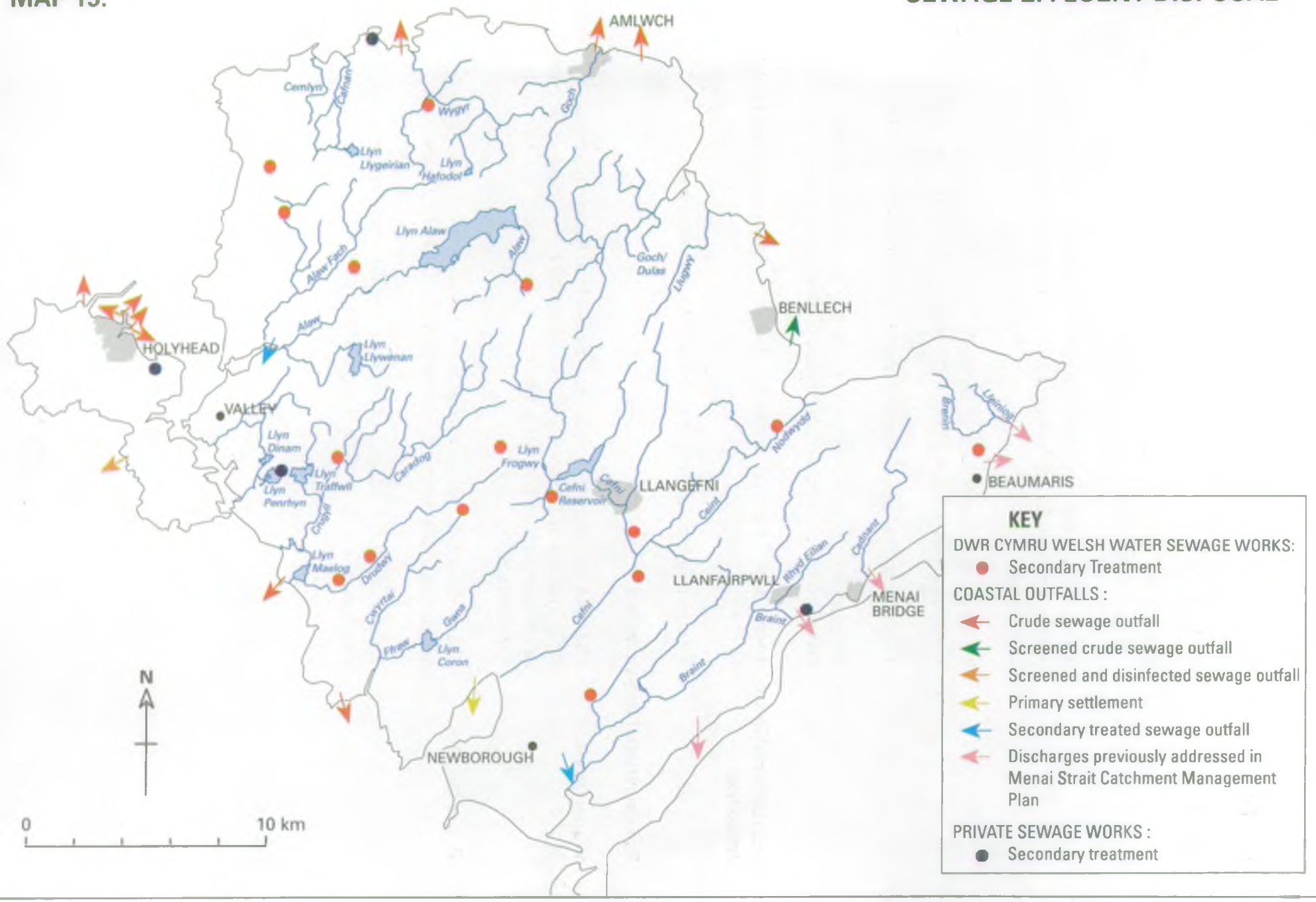
Water Quality

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

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

MAP 15.

SEWAGE EFFLUENT DISPOSAL



4.10 SEWAGE EFFLUENT DISPOSAL

General Information

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

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

Local Perspective

About half of Anglesey's 70,000 resident population are served by the DCWW sewerage system. The remainder are connected to septic tanks or private systems about which little is known. The 'public' sewerage system conveys sewage either to treatment plants, of which there are 24 providing various levels of treatment, or with no treatment to tidal waters via 13 crude outfall pipes.

Llangefni STW is the largest and most sophisticated on Anglesey and until recently had a severe downgrading effect on the Cefni. However, improvements costing about £2M have recently been completed and the works should now be able to comply with its long term discharge consents. Generally, the discharges from the other sewage treatment plants comply with their consents.

Since the privatisation of the water industry in 1989, there have been significant improvements to a number of coastal crude sewage discharges near identified EC Bathing Waters. Whilst much remains to be done DCWW are committed to eliminate all their crude sewage discharges by 2005.

Improvement works have been completed at Trearddur Bay with the installation of fine screening and disinfection, and at Benllech where fine screens and a long (3.5km) sea outfall have been provided. This should ensure that the two beaches comply with the standards in the EC Bathing Waters Directive (76/160/EEC). The screening and disinfection at Trearddur Bay is only an interim arrangement pending transfer to Holyhead when a new scheme is provided in the period 2000-2005.

A new biological treatment plant and outfall is under construction at Brynsiencyn. At Llanfaes, primary settlement with a deep water outfall has been provided to deal with sewage from Beaumaris. These were covered in the Menai Strait Catchment Management Plan. They are mentioned here for completeness.

Despite the above improvements there are still 11 untreated sewage discharges around the Anglesey coast which require appropriate treatment by the year 2005. Due to the proximity of the identified EC Bathing Water the Rhosneigr scheme which includes secondary treatment is in the AMP2 programme and is due for completion in 1999. Other outfalls, such as those serving Holyhead, will be dealt with on a priority basis in line with the timescale driven by the EC Urban Waste Water Treatment Directive and the AMP2 programme negotiated between ourselves and DCWW.

At Trearddur Bay and Amlwch, environmental problems are caused by premature discharges from CSOs on sewerage systems. There is an agreed water company investment programme to address these problems and construction work at Amwlch to remove unsatisfactory overflows is now complete. However, there are 1200 such unsatisfactory discharges out of a total of 2500 in Wales and only £72M to resource the AMP2 CSO improvement programme. Only the highest priority discharges will be dealt with during the life of this Plan.

There are 16 private consented sewage discharges, the more significant of which, such as Anglesey Aluminium and Wylfa Power Station, we monitor routinely. It is suspected that there are a number of private untreated and unconsented sewage discharges to coastal waters around Anglesey. As the main municipal sewage discharges are improved, attention will be focused on improving these smaller private discharges.

Aims

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

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

Environmental Requirements:

Water Quality

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

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

Water Quantity

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

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

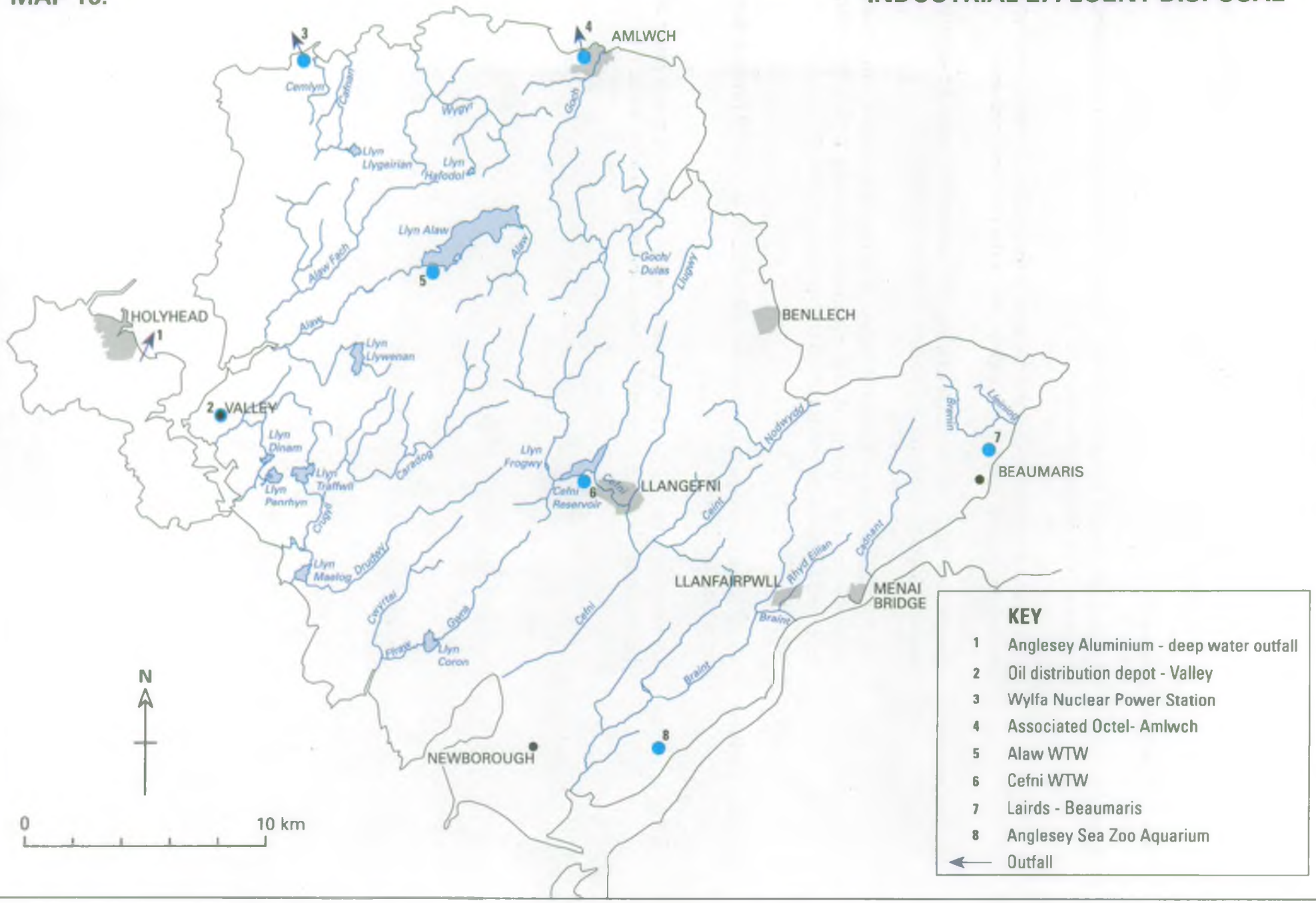
Physical Features

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

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

MAP 16.

INDUSTRIAL EFFLUENT DISPOSAL



4.11 INDUSTRIAL EFFLUENT DISPOSAL

General Information

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

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

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

Local Perspective

Anglesey is home to a bromine extraction plant that is unique in Europe. The Associated Octel plant at Amlwch extracts bromine from seawater by acidifying large volumes of seawater (about 3,000,000m^3 per day) and displacing the naturally occurring bromine, present in seawater at around 65 mg/l, with injected chlorine. The bromine produced is refined and used to make a number of specialist products. The plant is subject to Integrated Pollution Control administered by HMIP.

Other significant industries on Anglesey with aqueous discharges are Nuclear Electric at Wylfa Power Station and the Anglesey Aluminium smelter near Holyhead. These have a number of consented discharges which are regularly monitored.

Most other industries on the island are based in the centres of Llangefni, Amlwch and Holyhead and discharge effluent to DCWW's sewerage system. The main industries are the pharmaceutical company Peboc, the mozzarella cheese factory Golden Foods and Cymru Country Chicken's processing plant, all based in Llangefni.

The Peboc site is controlled by an IPC authorisation and site drainage is collected in a tank and tested before being allowed to discharge to the Afon Cefni. If tests show the quality to be unsuitable, the tank contents are pumped to the foul sewer for treatment.

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

Environmental Requirements:

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

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

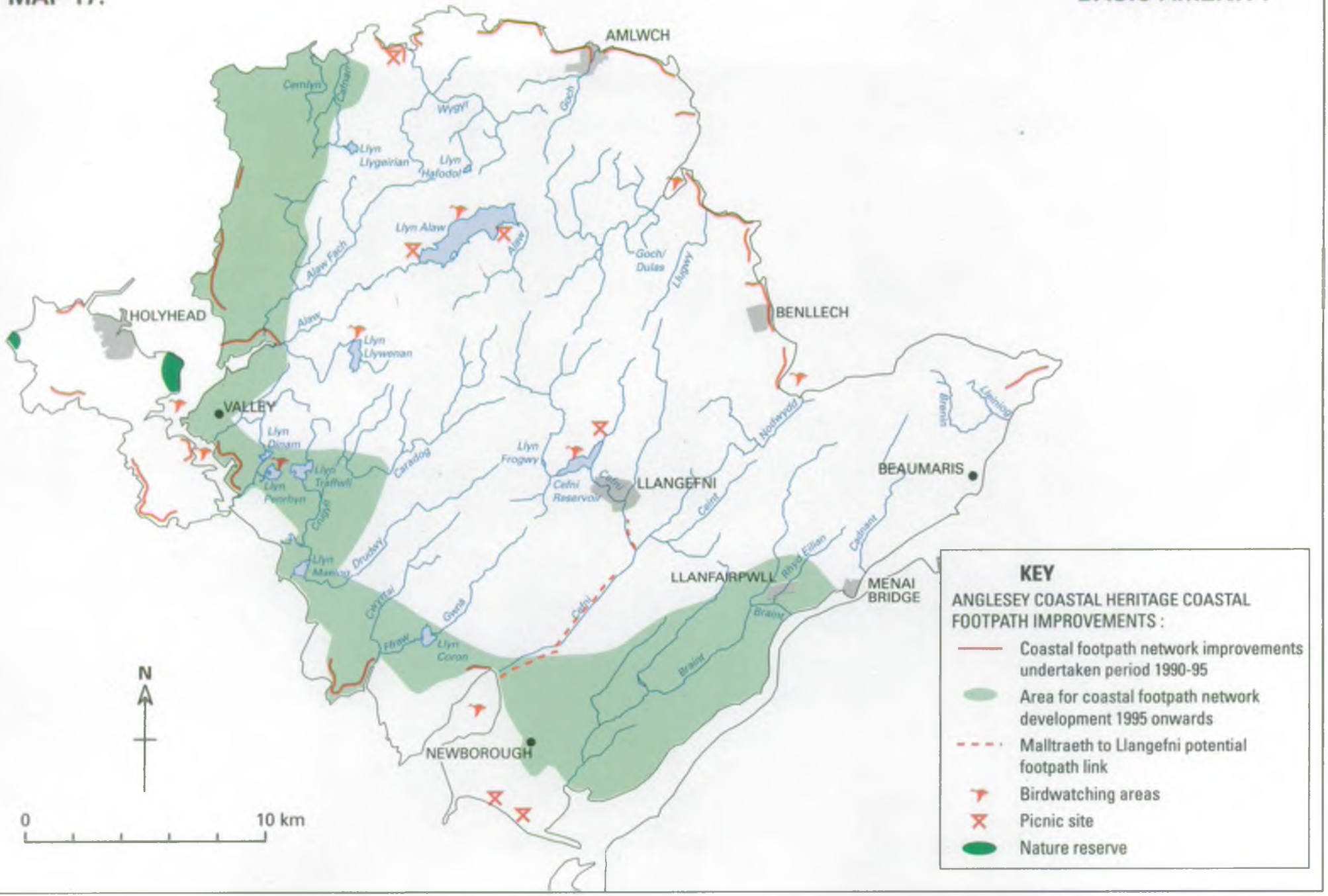
Water Quantity Consent conditions will be derived taking into account the upstream dilution available under average and dry weather flow conditions.

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

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

MAP 17.

BASIC AMENITY



4.12 BASIC AMENITY

General Information

Basic amenity relates to those activities that are principally land based but could by their nature, attract people to the river environment. Examples include walking, picnicking and bird watching. The main areas of concern are therefore the general aesthetic acceptability of the river corridor, access and public safety.

Local Perspective

The coastal section of Anglesey is largely designated AONB (part Heritage Coast) and consequently of high amenity value, particularly for walking and birdwatching. Facilities for birdwatchers have been developed at Holyhead Country Park, South Stack, Llyn Alaw, Malltraeth and Newborough. Wildfowling occurs on the estuaries of the Cefni and Nodwydd and in the Cymyran Straits.

Ynys Môn Borough Council is currently developing a coastal footpath network, linking areas of settlement with the coast. The project is scheduled for completion in 1997.

In contrast, riverside access is largely absent with the exception of the Afon Cefni which has continuous access for 10km from Llangefni to Malltraeth. Sections however are badly overgrown, obstructed by fences or are obscured by development.

Footpaths are common in the vicinity of lakes and reservoirs but patchy on wetlands. The NWWT reserve at Cors Goch and Llyn Maelog LNR are exceptions. Improvements to wetland access, where appropriate, form part of the Anglesey Wetlands Strategy. However, the requirement for riverside access is largely unknown and will need to be determined.

Picnic sites have not been widely developed on the island with the exceptions of Alaw and Cefni reservoirs and Newborough Warren.

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 be maintained at a level appropriate to prevent aesthetic nuisance.

Water Quantity

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

Physical Features

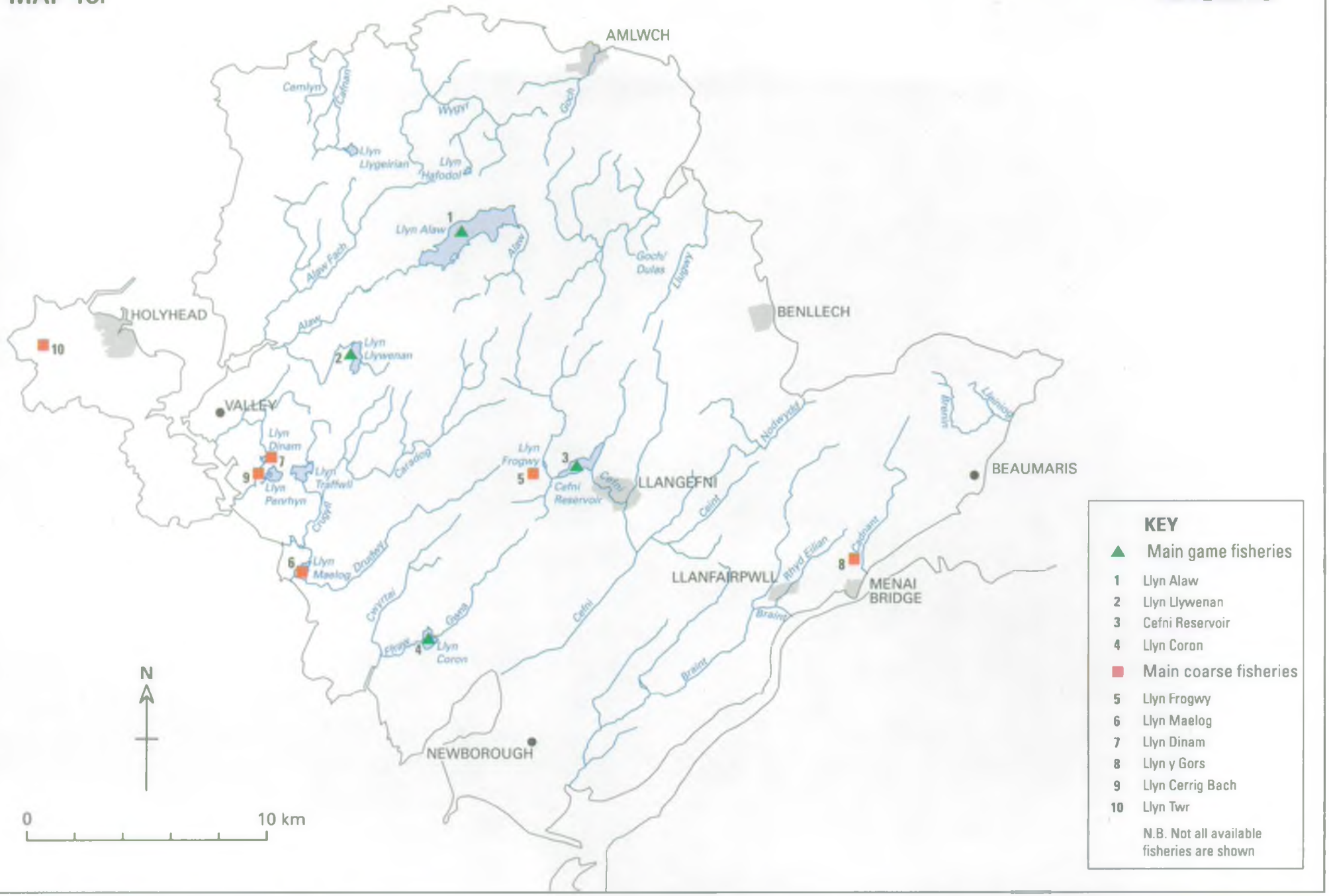
An appropriate network of riverside paths and access points should be maintained and, where appropriate, promoted.

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

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

MAP 18.

ANGLING



KEY

- ▲ Main game fisheries
- 1 Llyn Alaw
- 2 Llyn Llywenan
- 3 Cefni Reservoir
- 4 Llyn Coron
- ■ Main coarse fisheries
- 5 Llyn Frogwy
- 6 Llyn Maelog
- 7 Llyn Dinam
- 8 Llyn y Gors
- 9 Llyn Cerrig Bach
- 10 Llyn Twr

N.B. Not all available fisheries are shown

4.13 ANGLING

General Information

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

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

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

Local Perspective

All three forms of angling, sea fishing, game fishing and coarse fishing are enjoyed on the island. The running waters are dominated by game fish, predominantly trout. Sea trout are found in all the rivers but are mainly late running, not available to the rod fishery until the end of September.

Historically many of the still waters on Anglesey such as Llyn Coron, Llyn Llywenan and Llyn Hafodol were renowned game fisheries. Over the last 20 to 30 years increased eutrophication has resulted in a decline in the still water game fisheries. However, there are still important sites for game fishing on the island. Llyn Cefni is operated by the Cefni Game Fishing Association and catches in excess of 2,000 fish are taken annually. Although the lake is stocked, a significant proportion of the catch is from native brown trout that spawn in the tributaries flowing into the reservoir. Llyn Alaw, owned by Dwr Cymru Welsh Water and operated as a put and take game fishery, is also a popular venue. Still water trout fishing is also available to the public at Llyn Coron, Llyn Parc Newydd and Llyn Jane.

Ten years ago the angling season for migratory trout and salmon was extended on Anglesey until November 17th on an experimental basis. It is known that the migratory salmonids enter Anglesey rivers late and that spawning does not usually commence until well into November. Although the extension provides additional sport at the end of the season, rod catches indicate that the number of people taking this opportunity is low. Information from various sources indicates that sometimes, fish that are about to spawn are taken. This experimental extension will need to be reviewed shortly.

The Holyhead Freshwater Fishing Club is now the only coarse fish club present on the island. Coarse fishing is a popular sport in the vicinity of the Valley lakes, including Llyn Cerrig Bach, Whitehouse Lake and Llyn Dinam. Llyn Penrhyn used to be an important venue for match fishing but catches have declined in recent years. Recent survey work indicated a very small population of fish and further investigation is required. Attempts to establish a coarse fishery at Llyn Twr at Holyhead have had disappointing results. Although coarse fish have been stocked, very few were present after one year and it is suggested that predation by cormorants is the limiting factor.

The natural coarse fish population on Anglesey lacks diversity and the majority of the species present are the result of stocking. Pike are now well established in Llyn Maelog. This was not a consented stocking and this population is the only pike population on Anglesey. It has proved to be quite popular with anglers however and several large pike have been caught. This lake also contains a population of bream resulting from stockings in the 1980s.

Several other venues for coarse fishing are available. Notable among these is the series of lakes at Gors Farm where top class coarse fishing is available on a day ticket.

Angling seasons for migratory fish extend from the 20th March until the 17th October. The season for brown trout is from the 3rd of March to the 30th of September. The season for migratory trout and salmon fishing on Anglesey, with its experimental extention until November 17th, will for the time being continue. There is no close season for coarse fishing on lakes on Anglesey and this proves to be a very popular with visiting coarse fishermen. The coarse fishing close season from 16th March to 15th June only applies to running waters.

A fishery guide, produced by us, listing the waters available for the various types of angling within the catchment, is available on request.

Aim

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

Environmental Requirements:

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

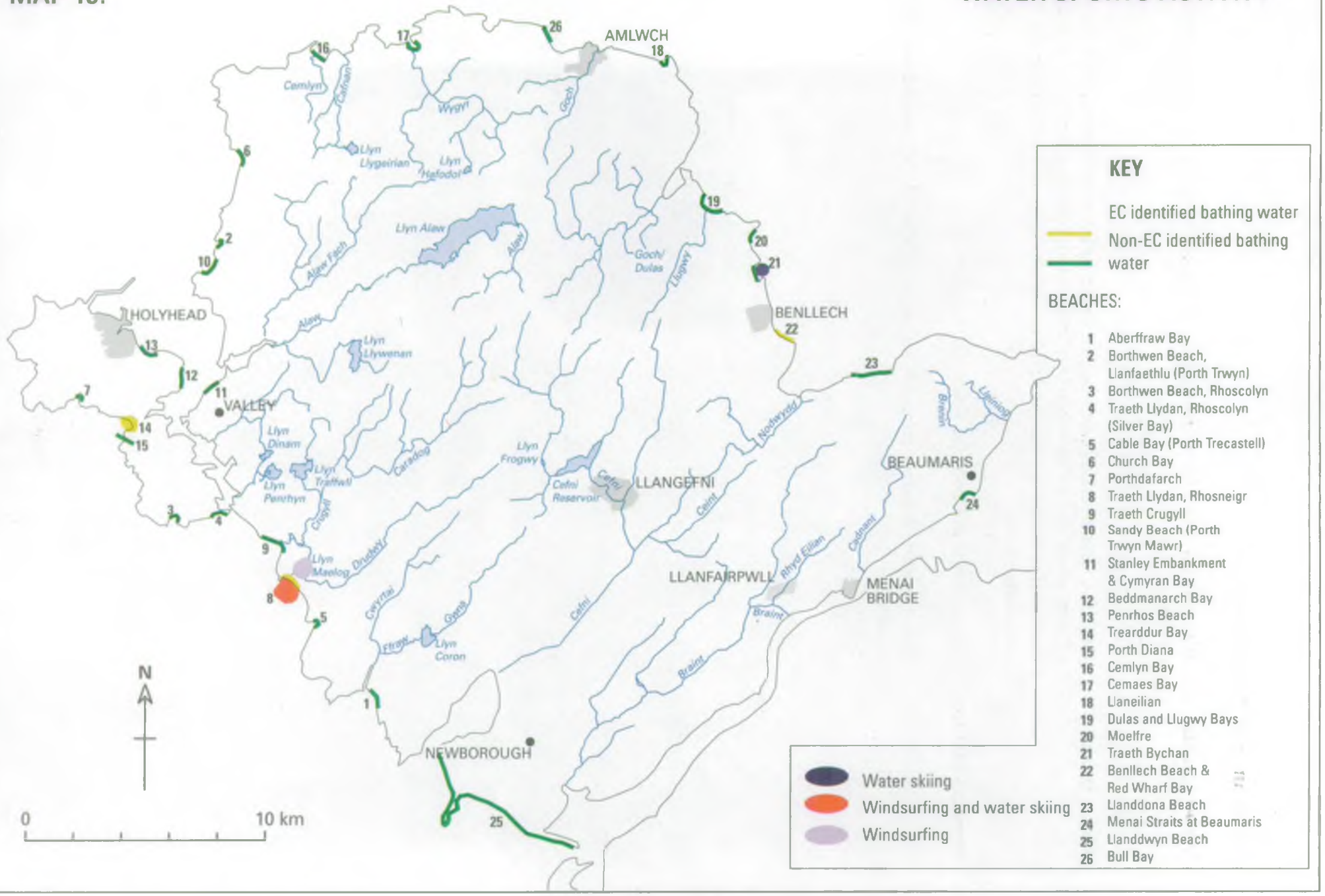
Water Quantity The NRA has the task of balancing the needs of the environment, with those of abstractors and other users. An abstraction licensing policy has been developed to ensure that this is carried out consistently and effectively for all new abstractions.

Physical Features Safe access to and from the waterside should be promoted.

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

MAP 19.

WATER SPORTS ACTIVITY



KEY

EC identified bathing water

Non-EC identified bathing water

BEACHES:

1. Aberffraw Bay
2. Borthwen Beach, Llanfaethlu (Porth Trwyn)
3. Borthwen Beach, Rhoscolyn
4. Traeth Llydan, Rhoscolyn (Silver Bay)
5. Cable Bay (Porth Trecastell)
6. Church Bay
7. Porthdafarch
8. Traeth Llydan, Rhosneigr
9. Traeth Crugyll
10. Sandy Beach (Porth Trwyn Mawr)
11. Stanley Embankment & Cymyran Bay
12. Beddmanarch Bay
13. Penrhos Beach
14. Trearddur Bay
15. Porth Diana
16. Cemlyn Bay
17. Cemaes Bay
18. Llaneilian
19. Dulas and Llugwy Bays
20. Moelfre
21. Traeth Bychan
22. Benllech Beach & Red Wharf Bay
23. Llanddona Beach
24. Menai Straits at Beaumaris
25. Llanddwyn Beach
26. Bull Bay

Water skiing

Windsurfing and water skiing

Windsurfing

4.14 WATER SPORTS ACTIVITY

General Information

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 standards in the EC Directive and are sampled according to the DoE/WO guidelines during the bathing season (May to September inclusive). In Wales, these are exclusively saline waters.

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 we do not recommend bathing in freshwaters.

Local Perspective

Sports activities associated with the water environment, particularly in the coastal waters are an extremely important part of the local tourist industry. Anglesey has many bathing beaches on all sides of the island. 26 beaches are subject to local authority sea shore and sea side pleasure boat byelaws. This excludes certain boating activities between the 1st April and the 30th September each year. Amongst the most popular of the beaches are Benllech, Red Wharf Bay, Trearddur Bay, Rhosneigr and Llanddwyn. Of these Benllech, Trearddur Bay and Rhosneigr have been identified under the EC Bathing Waters Directive (76/160/EEC) and all currently comply with the standards in the directive.

Windsurfing is a very popular activity all around the Anglesey coast. The main centre is Rhosneigr where up to 80 windsurfers can be present at any one time. The popularity of Rhosneigr for windsurfers is probably enhanced by the presence nearby of a more sheltered freshwater site on Llyn Maelog, which is used by windsurfers when the coastal waters are too rough. Concern about the use of Maelog by windsurfers has been expressed by the local angling and conservation interests.

Water skiing has become an important water sport around Anglesey coasts, the main centre for this activity is Traeth Bychan on the north east coast, closely followed by Rhosneigr. In recent years, more water skiing activity has been recorded on the Inland Sea, the stretch of water between Holy Island and the mainland.

The number of jet skiis and power boats using Anglesey waters has increased in recent years. As the numbers participating in the sport has increased so has the potential for conflict between this and the conservation uses. Close monitoring of the situation by the local authority, will be required.

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.

Environmental Requirements:

Bathing in Identified Waters:

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

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

Water Contact/Recreational Use Waters:

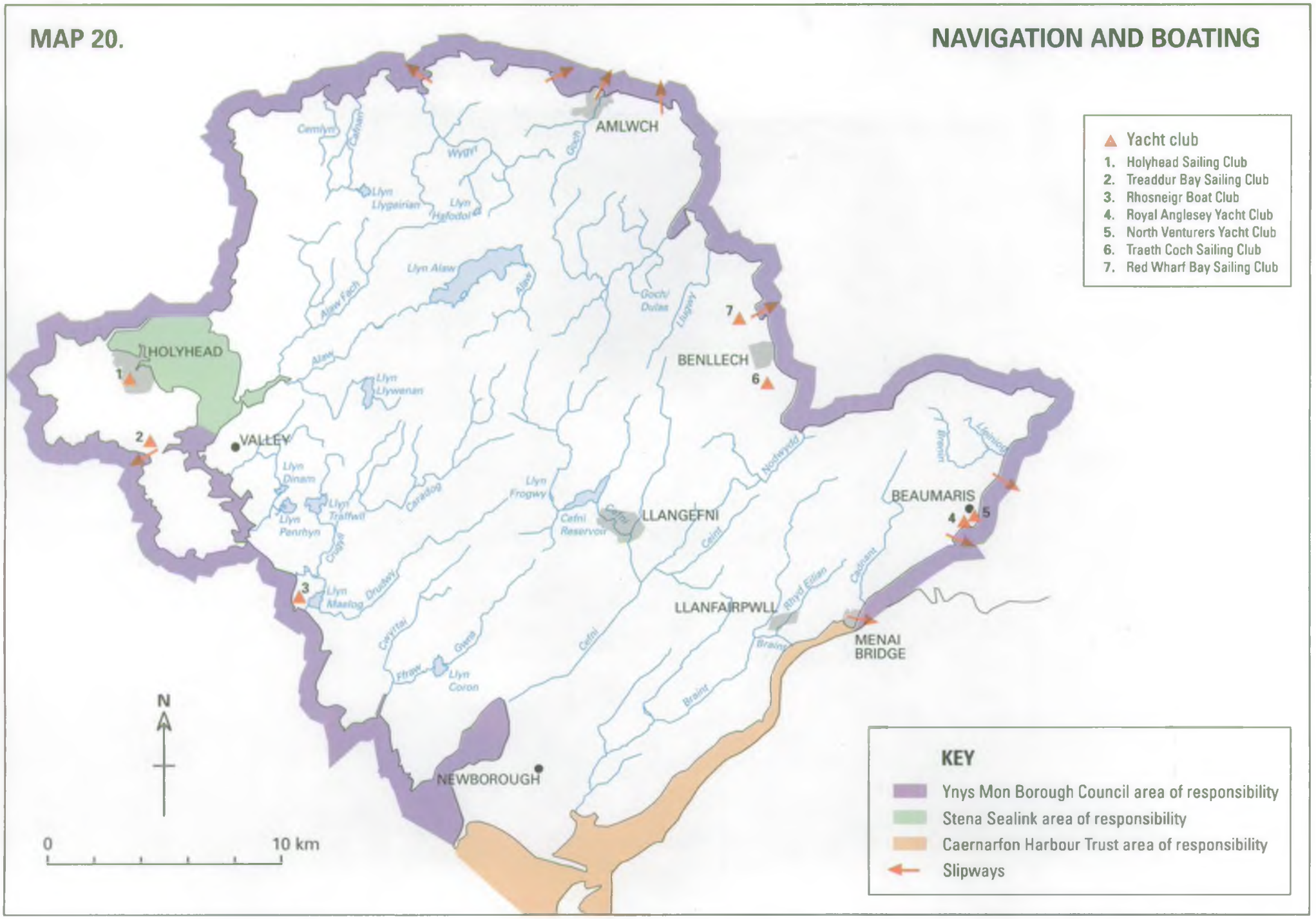
Water Quality Where marine waters are used for immersion sports, including bathing, we are guided on appropriate standards to protect public health by MAFF and local Environmental Health departments. We are unable to set bacteriological standards in CMPs for freshwaters where immersion sports or bathing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

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

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

MAP 20.

NAVIGATION AND BOATING



4.15 NAVIGATION AND BOATING

General Information

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

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

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

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

Local Perspective

We do not have any responsibility for provision of navigation aids in Anglesey coastal waters. Ynys Môn Borough Council have the responsibility for servicing seasonal marker buoys off the 26 beaches covered by the Sea Shore and Seaside Pleasure Boat Byelaws. These byelaws cover the period from the 1st April to the 30th September every year. At Rhosneigr a buoy channel is maintained through the protected bathing area, and at Trearddur Bay an additional line of buoys prevents windsurfers and sail boards entering the bathing area. On all 26 beaches the maximum speed limit, inside the line of buoys, is restricted to 8 knots. Trinity House has the responsibility for all other navigation buoys, 2 situated off Puffin Island and an additional 4 situated off the islands on the north west tip of Anglesey.

Stena Sealink is the designated harbour authority for Holyhead and their area of jurisdiction covers an area from just north of the Holyhead breakwater to just north of the Stanley Embankment. The fish dock in Holyhead port is leased from Stena Sealink by the local authority. All buoys within the Holyhead port area are maintained by Stena Sealink.

The isle of Anglesey is a noted centre for yachting and pleasure boating. The local authority operates 6 public slipways in the area covered by this plan, with an additional 3 slipways on the shore adjoining the Menai Strait (see Map 20). Seven yacht clubs or sailing clubs are based on the island, two in Beaumaris and one at each of Red Wharf Bay, Traeth Bychan, Holyhead, Trearddur Bay and Rhosneigr.

Off-shore fishing is catered for by organised trips mainly from the ports of Holyhead, Amlwch and Beaumaris.

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.

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

Environmental Requirements:

Water Quality

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

Water Quantity

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

Physical Features

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

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

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

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

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

4.16 AGRICULTURAL ACTIVITY

General Information

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

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

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

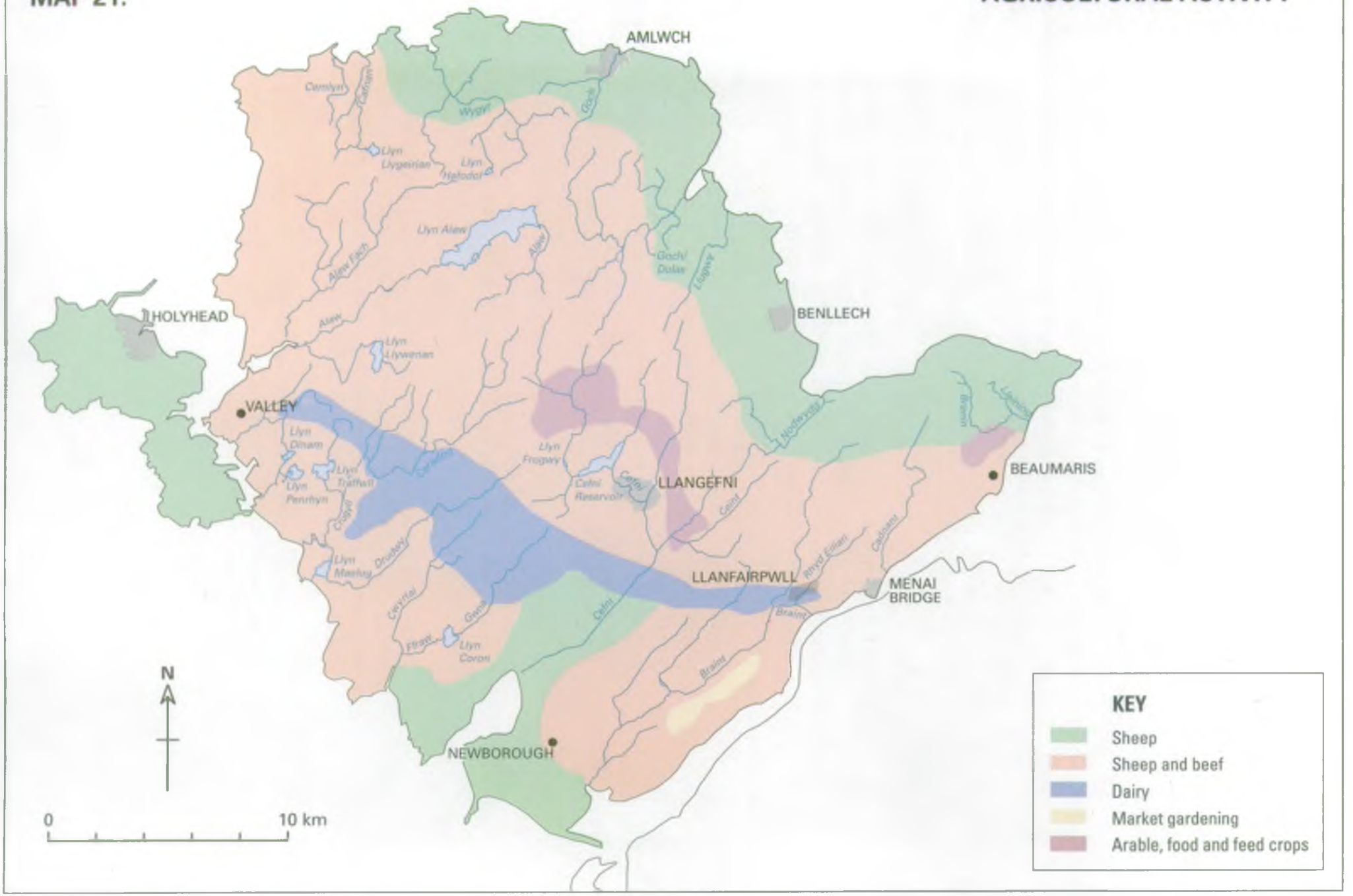
We issue codes of practice for the use of fertilisers, herbicides and pesticides, to protect the water environment and, in certain places (Nitrate Sensitive Areas), may control the application of fertilisers to protect groundwater supplies.

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

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

MAP 21.

AGRICULTURAL ACTIVITY



Local Perspective

Agriculture is the predominant land use on Anglesey. The low topography, temperate, climate and fertile soils provide ideal conditions for a variety of agricultural activities. Arable farming, market gardening, chicken, pig, sheep, beef cattle rearing and dairy farming are all pursued on the island.

Approximately 70% of agricultural land on the island is classed as arable or managed grassland. This proportion has been higher in the past but cereal production has been in steep decline in recent years. Stock rearing is now the main agricultural activity on Anglesey with over ¼ million indigenous sheep, which are augmented by mountain sheep in winter, and approximately 65,000 cattle. Chicken farming is a significant contributor to the local economy and a provider of employment. Cymru Country Chicken has 20 farms on Anglesey which at any one time house 2.5 million birds. These produce chickens for a processing plant at Llangefni which supplies frozen chicken to a number of large supermarket chains. Pig production has declined on Anglesey recently, though localised pockets remain and are thought to rear in the region of 5200 pigs.

The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991 and The Code of Good Agricultural Practice for the Protection of Water have begun to set new standards of construction and farm management. Adherence to these should help to reduce the incidence of agricultural pollution. However, the removal of grant aid in 1994 has reduced investment in pollution prevention on farms.

We have instigated a programme of farm inspections on Anglesey targeting each river catchment in turn. The Braint catchment was targeted in 1994 and the Alaw catchment in 1995, with the remainder being targeted over the next few years. The advice and actions arising from the inspections, together with existing measures should minimise the risk of future pollution. This will assist our objective to maintain and improve water quality on Anglesey.

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

Discharges should comply with all the conditions stated within the discharge 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

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

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

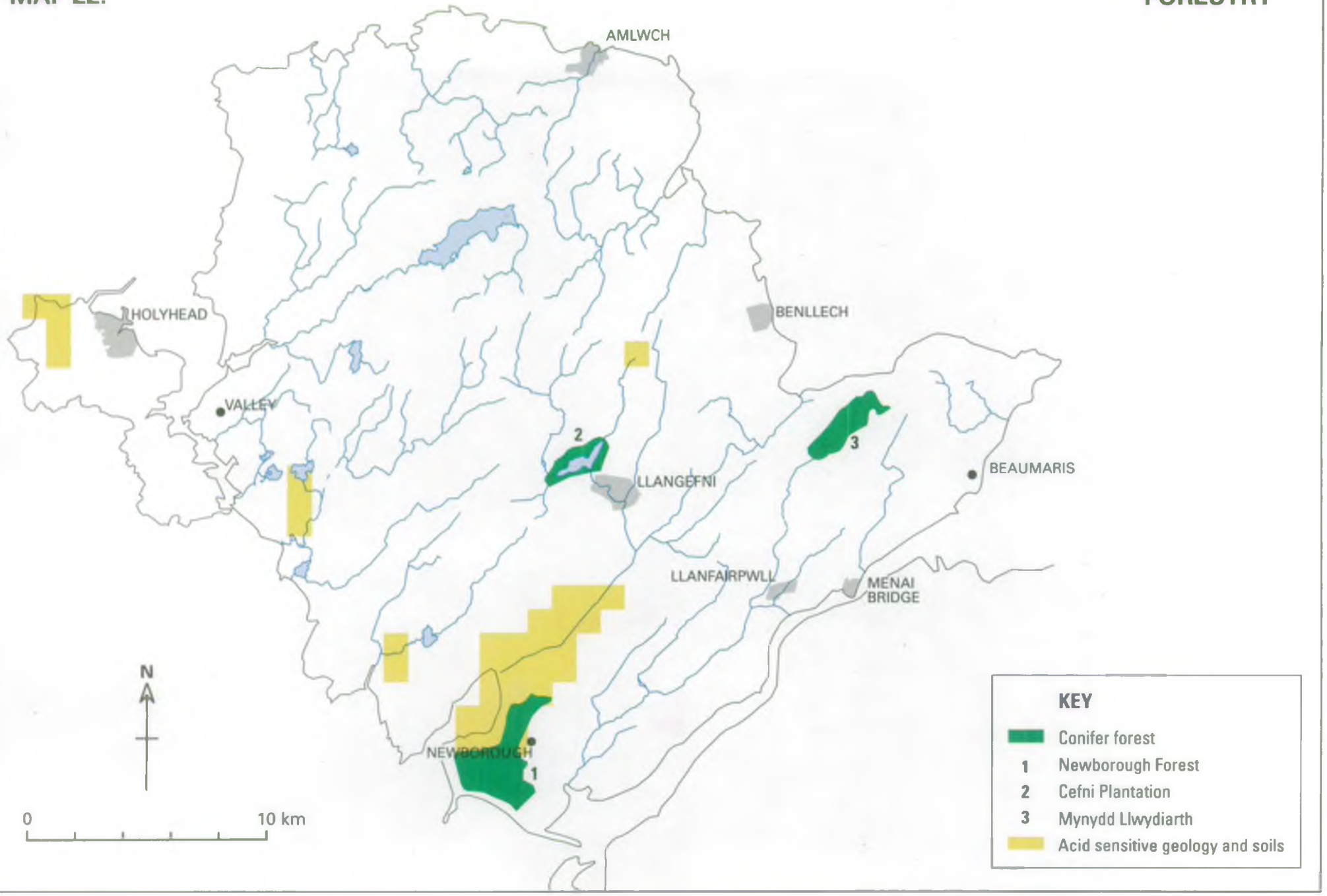
Physical Features

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.

MAP 22.

FORESTRY



4.17 FORESTRY

General Information

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

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

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

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

Local Perspective

Apart from many small private forest coverts there are only three significant areas of conifer plantations on Anglesey at Newborough, Mynydd Llwydiarth and Cefni reservoir. Newborough forest is an extensive area of 6km^2 with nature trails and conservation ponds and serves to stabilise extensive sand dunes. There appear to be no water quality issues associated with the forest. However, studies have shown that the water table in the adjacent Newborough Warren national nature reserve has fallen over the last 50 years.

The mature woodland around Cefni reservoir is undergoing cropping and re-planting. Clearly, there is potential for increased sediment load, possible nutrient release and an impact on the quality of runoff reaching the reservoir while these operations are underway. Forest Enterprise, DCWW and ourselves will continue to work together to ensure that these forest operations have a minimal impact on the water environment.

Aims

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

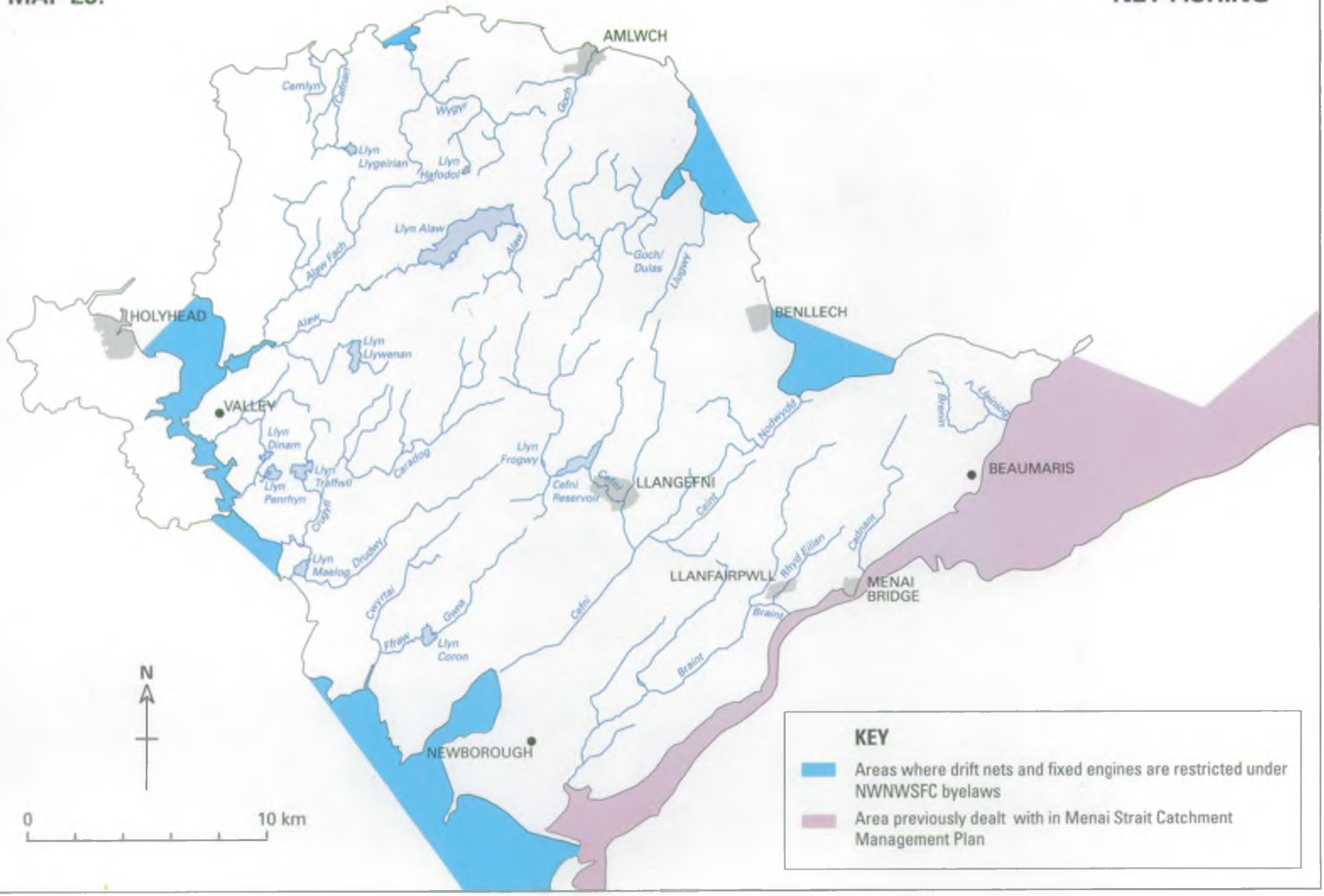
To encourage forestry practices that improve the water environment.

Environmental Requirements:

The Forests and Water Guidelines should be followed.

MAP 23.

NET FISHING



4.18 NET FISHING FOR SALMON, TROUT AND EELS

General Information

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

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

Local Perspective

Historically two draft net licences for the commercial fishing of salmon and sea trout were available for the area between South Stack and the north eastern end of Puffin Island. These licences were issued annually and covered the period 1st April - 31st August. However, a recent review of the Net Limitation Order controlling the issue of commercial salmon and sea trout nets has accepted that these nets should be phased out and from 1996 none will be available.

The coast of Anglesey has traditionally been a popular venue for operating fixed nets and drift nets to intercept sea fish. In 1993 byelaws were introduced prohibiting drift netting and fixed nets at five locations around the Anglesey coast. At four of the locations, Dulas Bay, Cemmaes Bay, the inland sea/Rhosneigr and Malltraeth Bay the period of prohibition is from 1st April - 30th November each year. However, at Red Wharf Bay the period of prohibition is from 1st of October - 30th April. At this site significant catches of sea trout have been made over the winter period and this is the only area in Wales where a prohibition is in place covering the winter period. It is possible that the coastal waters of Anglesey are a major year round sea feeding area for sea trout. Investigative work is required to determine how important these waters are for sea trout. At Malltraeth Bay and at Dulas Bay drift netting is allowed provided the netsman has an authorisation issued by the North Western and North Wales Sea Fisheries Committee.

Elsewhere around the Anglesey coast, drift netting in inshore waters takes place at many locations, with bass being the main target species. All sea trout

and salmon taken in these unlicensed nets have to be returned to the water immediately, dead or alive.

Most of the Anglesey lakes and rivers contain a good population of eels and historically eel fishing, by fyke netting has been undertaken on a small scale by a small number of netsmen. In 1994 there were two netsmen operating on Anglesey.

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

Environmental Requirements:

Water Quality Water quality should be maintained at a level appropriate to prevent aesthetic nuisance: fish stocks are protected by the provisions within the Fisheries and River Ecosystem Uses (Sections 4.4 & 4.5)

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

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

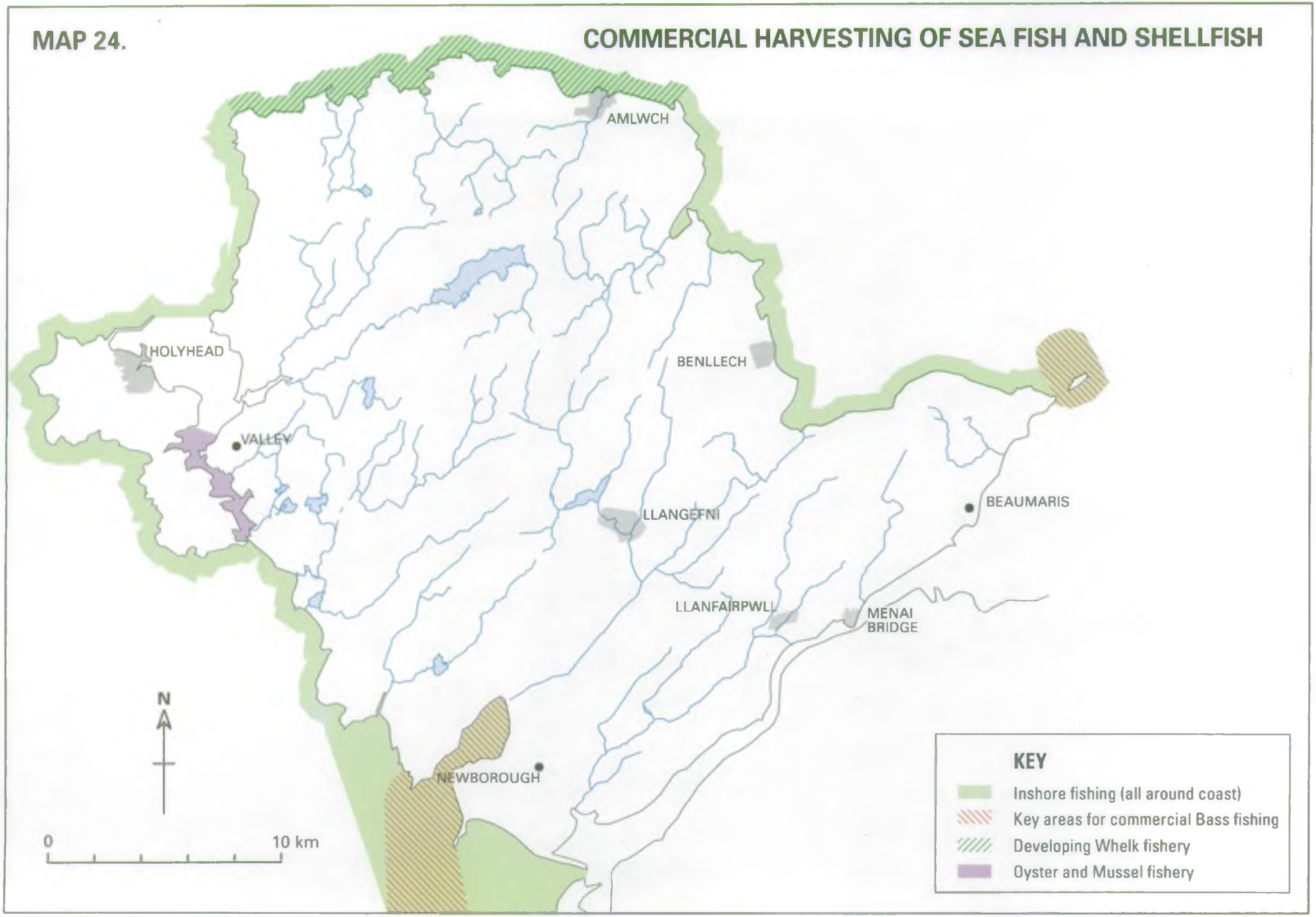
To license and regulate net fishing for eels and non-salmonid freshwater fish to protect stocks.

To minimise conflict between the requirements of different fisheries.

Access points for net fisheries should be protected.

MAP 24.

COMMERCIAL HARVESTING OF SEA FISH AND SHELLFISH



4.19 COMMERCIAL HARVESTING OF SEA FISH AND SHELLFISH

General Information

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

Sea Fisheries

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

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

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

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

Shellfisheries

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

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

Local Perspective

Some commercial fishing takes place in inshore coastal waters by boats, predominantly from the Anglesey ports of Holyhead, Cemmaes Bay and Amlwch and from the mainland ports of Bangor, Caernarfon and Conwy. The main catches are skate, mackerel, herring and bass during the warmer months of the year, with whiting and codling predominating over the winter period.

At Malltraeth Bay and around Puffin Island commercial angling for bass frequently takes place, usually using live or fresh sand eel as bait and substantial catches have been made in recent years.

There are no Designated Shellfisheries in the plan area, but a whelk fishery is developing off the north Anglesey coast and oysters and mussels are commercially harvested in the Inland Sea.

Aims

To maintain and where possible enhance, marine and shellfisheries.

To protect migrating salmon and sea trout from interference by marine fishing activities.

Environmental Requirements:

Marine Fisheries:

Water Quality

Discharges to coastal waters should be controlled to meet the rquirements of the EC Dangerous Substances Directive.

Physical Features

Marine fishing activities should not interfere with the migration of salmon or sea trout.

The physical marine environment should not be altered in a manner that would affect migratory fish stocks.

To enforce statutory measures that protect bass and other sea fish stocks, where appropriate.

Shellfisheries:

Water Quality

Discharges to coastal waters should be controlled to meet the rquirements of the EC Dangerous Substances Directive.

Water quality at shellfisheries designated under the EC Shellfish Waters Directive should comply with the appropriate standards. The Shellfish Hygiene Directive has no associated target classes and therefore no Environmental Requirements can be set.

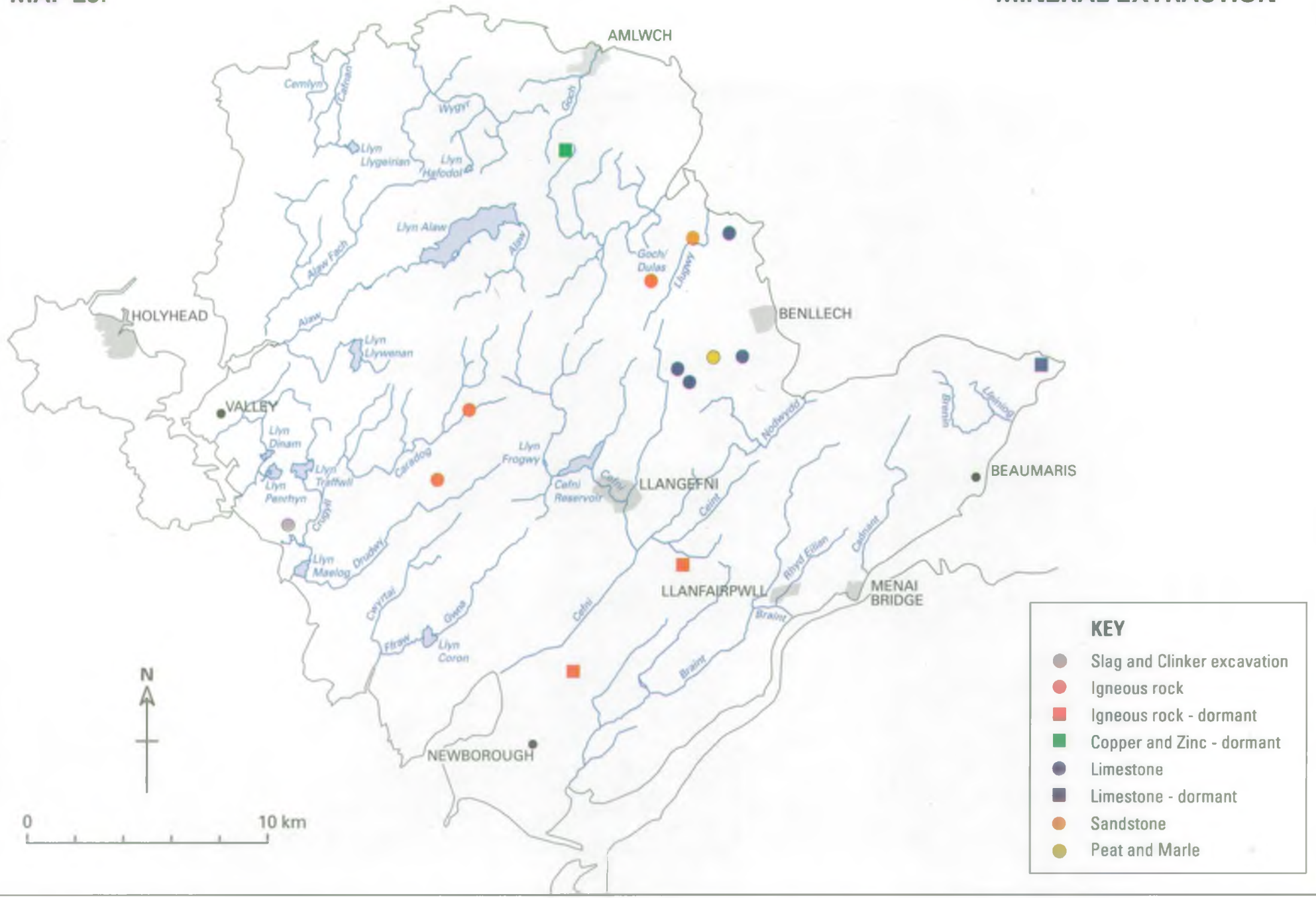
Where a recognised commercial shellfishery has not been officially designated under the EC Shellfish Waters Directive, we will, for the purpose of setting informal targets for Catchment Plans, be guided by the provisions of that directive.

Water Quantity

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

MAP 25.

MINERAL EXTRACTION



4.20 MINERAL EXTRACTION

General Information

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

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

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

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

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

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

Local Perspective

Parys Mountain near Amlwch is the most significant metal mining area on Anglesey. Here evidence of mining goes back to Bronze Age and Roman times. In the late 1800s Parys Mountain was the largest copper mine in the world exporting about 40,000 tonnes per year of copper ore from the port of Amlwch. Recently, (1986-1992) the Anglesey Mining Company was floated and a new shaft sunk with the aim of starting a new mine. However, full scale operations have yet to begin. This will no doubt depend on the price and availability of copper on the world market.

Much of Parys Mountain is stripped of topsoil or covered in mine spoil. As a result, streams draining the area are contaminated by sulphuric acid and heavy metals, mainly iron, copper and zinc. We have commissioned research to look into the effects of the mine drainage and the feasibility and cost of remedial works. Most of the metal leached from the area is probably trapped in sediment in Dulas Bay. However, measurement of metal in seaweeds and sea water along the coast near Dulas does not show any significant increase in metal concentration.

Other mineral extraction activity on the island is concerned with quarrying hard igneous rock or limestone. One operator extracts coke and clinker from old steam railway activities to make lightweight building blocks. There are four active igneous rock quarries and three active limestone quarries on Anglesey. Three significant dormant quarries exist and clearly there could be scope for these to re-open if material is required for constructing the new A55 dual carriageway across Anglesey.

In general, quarrying causes few water quality problems on Anglesey as the low relief and low rainfall allow silts to settle out within the quarry confines. Many of the sites have potential for inert landfill and permission is currently being sought by operators of the Nant Newydd Quarry near Brynteg to receive inert waste.

Aims

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

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

Environmental Requirements:

Water Quality

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

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

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

Water Quantity

Mineral working and land reclamation should not have an adverse effect on surface and groundwater resources or the rights of licensed 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 we set targets for:-

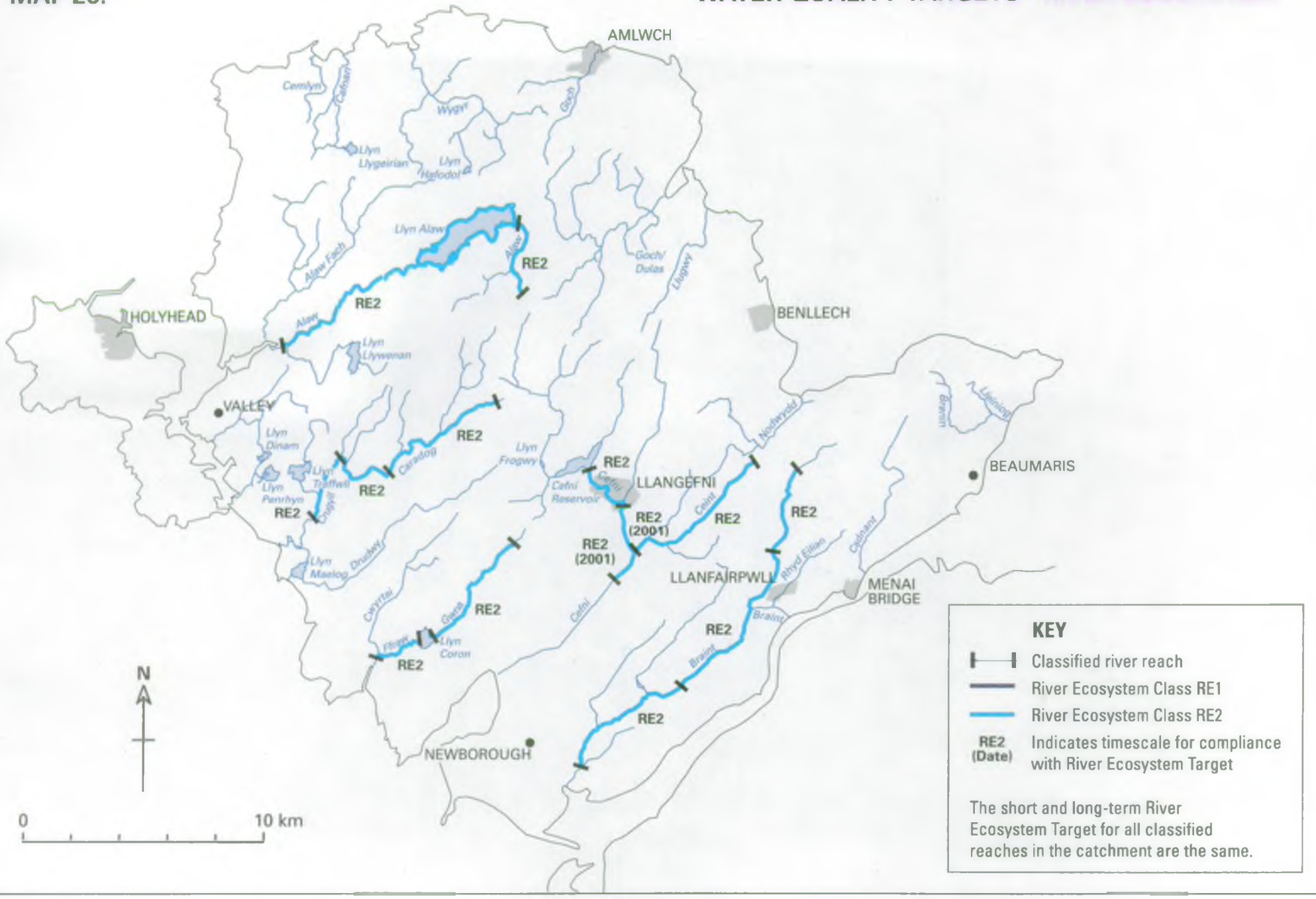
- Water Quality
- Water Quantity
- Physical Features.

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

- Sustainable development
- Environmental capacity

MAP 26.

WATER QUALITY TARGETS - RIVER ECOSYSTEM



KEY

- Classified river reach
- River Ecosystem Class RE1
- River Ecosystem Class RE2
- RE2 (Date) — Indicates timescale for compliance with River Ecosystem Target

The short and long-term River Ecosystem Target for all classified reaches in the catchment are the same.

5.1 WATER QUALITY TARGETS

General

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

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

SWQOs

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

The Government is currently conducting a pilot implementation of SWQOs following which it is hoped they will be applied more widely. Until then objectives proposed using the River Ecosystem scheme in this CMP will remain informal. They will however, form the basis of our approach to water quality management (replacing the National Water Council scheme). In this CMP we propose two RE objectives for each river stretch. The first, or long-term objective, represents our aspiration for water quality. Attaining this level of quality may not always be possible during the lifespan of a CMP (5-10 years) therefore we also propose a second RE objective. This reflects what improvements in water quality are achievable during the CMP's lifespan and therefore represents an interim objective which will be reviewed periodically. It is these interim objectives which will be given a statutory basis when and if implementation of the SWQO scheme proceeds.

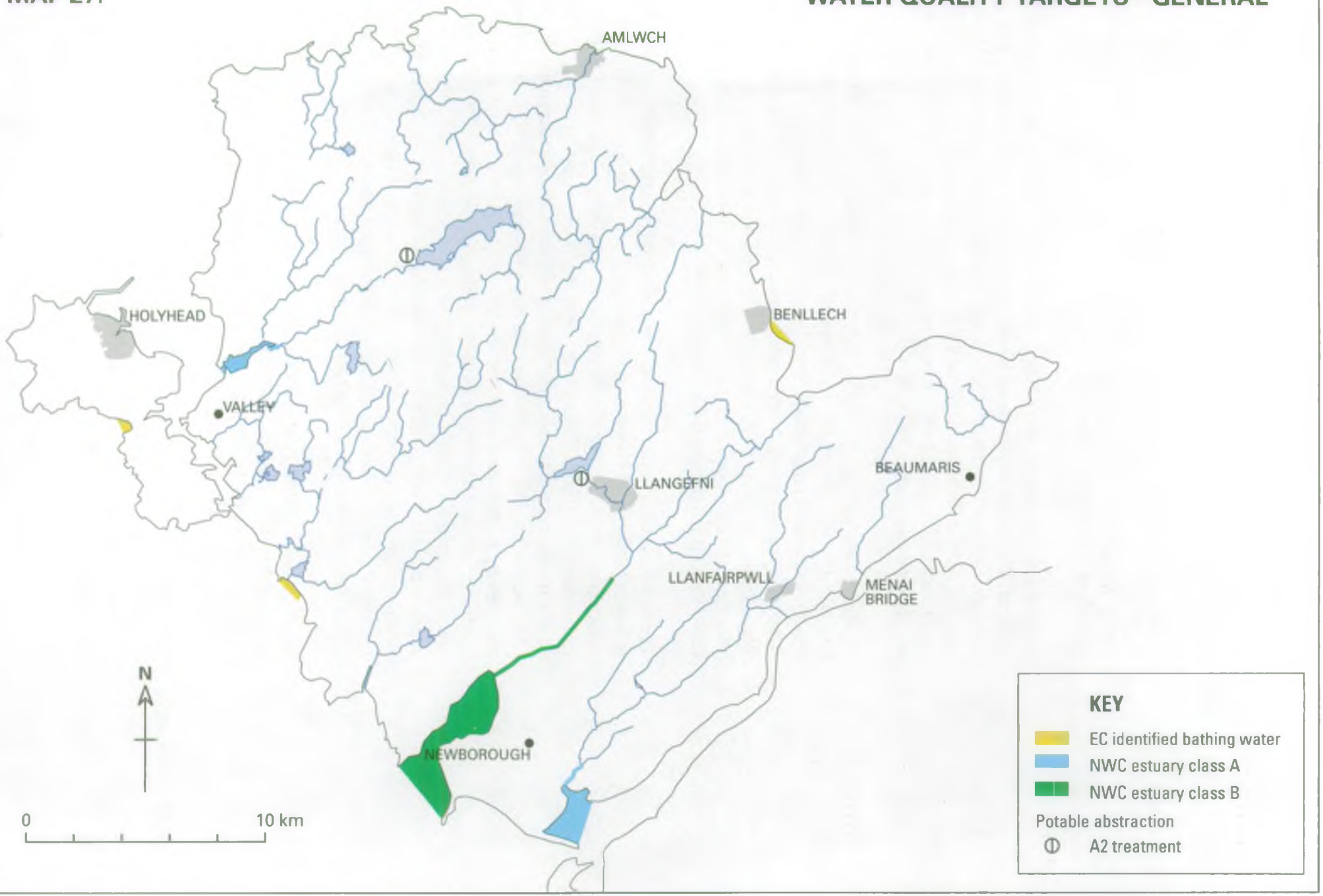
Where Uses are not supported by formal water quality standards we may set informal targets to protect a particular Use. These then provide additional water quality planning targets. Such standards have been developed for example to protect migratory salmonid fish in estuarine waters.

Local Perspective

The classified river reaches on Anglesey all have a proposed Short Term and Long Term River Quality Objective of RE2. This target will also be applied informally to all unclassified streams on the Island. Since the surface waters of Anglesey are 'naturally' rich in nutrients and organic matter, even in those

MAP 27.

WATER QUALITY TARGETS - GENERAL



catchments where human influence is at a relatively low level, there is no guarantee that RE1 standards could be consistently achieved. It seems sensible therefore to set the achievable goal of RE2 and not risk wasting effort and investment which may be better employed elsewhere.

The standards of the EC Bathing Water Directive (76/160/EEC) apply at three beaches, Rhosneigr, Trearddur Bay and Benllech.

Targets for the classified estuaries are those set out in the NWC Classification scheme. Class A will remain the target for the Braint, Ffraw and Alaw estuaries and Class B the target for the Cefni estuary.

The standards of the EC Surface Water Abstraction Directive (75/440/EEC) apply to Alaw and Cefni reservoir. The water quality at these reservoirs falls into that requiring an A2 level of treatment, ie. physical treatment, chemical treatment and disinfection. However, at both these reservoirs DCWW have elected to subject the abstracted water to a higher level of treatment. Both Alaw and Cefni water treatment works have recently been refurbished to ensure that EEC standards for potable water are met.

Compliance with the EC Dangerous Substances Directive (76/464/EEC) for the discharge of List II substances is a target for the Llangefni STW discharge.

Those parts of Anglesey underlain by limestone have been designated groundwater resource aquifer protection zones and the NRA's Groundwater Protection Policy seeks to implement the EC Groundwater Directive. This Directive aims to prevent substances in List 1 from entering groundwater and limiting the Introduction of List 2 substances so as to avoid pollution. This is particularly pertinent to landfill sites and the granting of waste management licences. The management licence for the existing Penhesgyn landfill requires groundwater to be monitored and the licence for the next phase of landfill requires the new site to be constructed for full containment with monitoring of groundwater quality from boreholes.

5.2 WATER QUANTITY TARGETS

General

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

We take a precautionary approach to the granting of new licences, and will only grant them if 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. We also regularly monitor the compliance of abstractors with licence conditions and enforce them as necessary.

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

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

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

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

Flow Requirements

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

Water Level Requirements

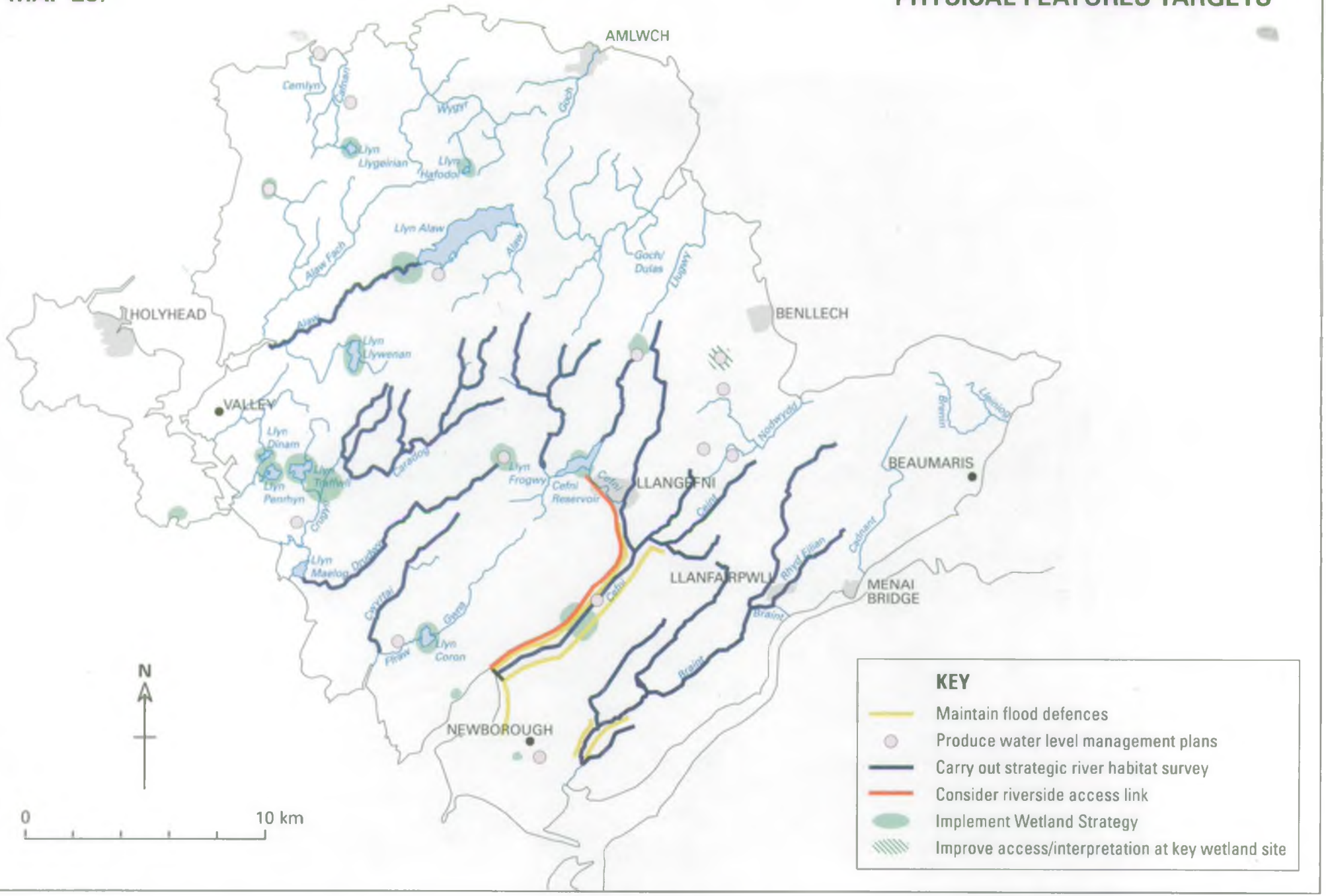
At some designated wetland conservation sites we will agree Water Level Management Plans, with the Coutryside Council for Wales and/or English Nature, to manage water levels to meet the needs of the protected ecosystem.

Additional Targets

The Authority will seek to ensure that any future public water supply requirements in excess of that now available will be met from the consideration of overall requirements for the NW Wales supply area under the Regional Water Resources Strategy Report.

MAP 28.

PHYSICAL FEATURES TARGETS



5.3 PHYSICAL FEATURES TARGETS

General

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

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

Flood Defence targets nearly all relate to physical features and the requirement for the river channel to contain 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 Anglesey catchment:

Flood Defence

Flood Protection

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

Land Use Band	Typical Description of Reach	Reference SoS - Flood Return Period (Years)	
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 (CCW).

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) (as amended by the 1994 Act), will:

- Ensure provision of suitable access for maintenance of river/channel and sea/tidal flood defence and for the construction of new defences by the limitation of development within 7 m of the top of the river bank (use of byelaws and planning laws).

- Ensure that obstructions to flow do not result in an increased flood risk (consent under WRA 1991 and LDA 1994).

- Ensure development on the flood plain is identified and encourage planning authorities to use the planning process to guide development away from these areas (section 105 (2) survey and W.O. 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 our operational, regulatory and advisory activities, and particularly in our role as a statutory consultee to the Local Planning Authorities, we will endeavour to ensure that there is:

- suitable habitat for fish breeding with an adequate distribution of potential redd sites and nursery areas.

- unimpeded access for migratory fish through the estuary and river to and from all potential spawning reaches (where appropriate), with adequate holding pools and cover throughout the catchment.

- effective fish screening on all abstractions and discharges (where necessary) to protect wild fish stocks and prevent escapement from fish farms.

Our intention to set specific targets relating to fish stocks and spawning success was recently announced in our published Fisheries Strategy . We will use the results of continuing fisheries monitoring surveys in the catchment to help in the determination of these targets, as well as data collected from rod and net catch returns.

Conservation

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

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

- biodiversity is maintained by:

  - retention of the current diversity of natural features such as riverbanks, wetlands, emergent vegetation, meanders, pools and riffles. We will encourage the fencing of water fringe zones and clearly defined livestock watering points to protect the riparian corridors from damage.

  - standards of service will be agreed with CCW/EN to maintain and if possible enhance the conservation value of SSSIs that could be affected by our activities. Priority will be given to NNRs and SACs, together with the adoption of water level management plans.

  - species management plans that may contribute to national species action plans, will be implemented for species that have a high conservtion need.

  - site management plans will be prepared, implemented and regularly reviewed for all of our sites which have conservation interest or potential.

- degraded habitats are restored by:

  - identification of areas degraded wetland and riverine habitat and, where possible, rehabilitation to a level where they can support a range of species which is typical of similar habitats in other parts of the catchment.

  - an agreed programme of control, in conjunction with others, where Japanese Knotweed or other alien weeds cause operational or other problems.

- riparian and wetland landscape characteristics are conserved.

- the physical structure and setting of historic and archaelogical sites, associated with water, is maintained and if possible enhanced. We will recognise the interdependance of many sites and monuments and where unavoidable change occurs will ensure that the detail of the site is carefully recorded.

Specific conservation targets for the Anglesey catchment will include the following:

- To maintain the diversity of aquatic plants in rivers, ditches and shallow lakes.

- To maintain and where appropriate look to enhance wetland habitats, particularly reedbeds with a view to restoring bittern.

- To establish riparian fencing at appropriate locations following a strategic overview of priorities.

- To continue our active commitment to the Anglesey Wetlands Strategy, in particular, reedbed restoration/creation at Plas Bog, Rhoscolyn, Garreg Lwyd and Malltraeth Marsh SSSIs.

- To investigate measures for the control of eutrophication on the shallow lake SSSIs.

Recreation

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

- an appropriate network of riverside paths and access points is maintained and, where appropriate, promoted.

- protection is given to existing recreational sites, and that the development of new sites is promoted at suitable locations, as opportunities arise.

- consideration is given to the design of paths, access points and recreational developments, taking into account, wherever possible, the needs of the infirm and disabled.

- provision is made for canoe touring, where appropriate, within the catchment.

Specific recreation targets for the Anglsey catchment will include the following:

- To collaborate with Ynys Môn B.C. in progressing the completion of the coastal footpath network by 1997.

- Determine requirements and promote key river footpath links in line with public demand. In particular to develop the link between Malltraeth and Llangefni

- Improve the access to wetland sites, where appropriate.

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 Anglesey Catchment. This new policy deals with the concept of vulnerability and risk to groundwater from a range of human activities. It considers both source and resource protection, together with policy objectives of the NRA with respect to the threat to groundwater from abstraction, physical disturbance of groundwater flows, waste disposal, contaminated land, discharges to underground strata, disposal of sludges to land and diffuse pollution.

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

The Policy recognises three groundwater source protection zones:

Zone I (Inner Source Protection)

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

Zone II (Outer Source Protection)

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

Zone III (Source Catchment)

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

APPENDIX 1b

THE REQUIREMENT FOR AN ABSTRACTION LICENCE

	0 - 5 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

GLOSSARY OF TERMS, UNITS AND ABBREVIATIONS

ABSTRACTION

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

ABSTRACTION LICENCE

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

ACUTE

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

ADIT

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

AFFORESTATION

The process of creating a forest where none existed before.

ALGAE

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

ALLUVIAL DEPOSITS

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

AMELIORATE

To cause something to get better.

AMMONIA

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

AOD (ABOVE ORDNANCE DATUM)

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

AQUATIC ENVIRONMENT

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

AQUIFER (MINOR AQUIFER)

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

BASE - FLOW

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

BIOACCUMULATION

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

BOD

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

BUFFER ZONE

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

CATCHMENT

The area of land draining to a defined point.

CHRONIC

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

CLASSIFICATION/CLASSES

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

COARSE FISH

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

CONFLUENCE

The point where two or more streams or rivers meet.

CONSENT

Two types of consent are issued by the NRA:

Discharge Consents are statutory documents 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.

CUMECS

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

DANGEROUS SUBSTANCES

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

DEROGATION (Water Quality)

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

DEROGATION (Water quantity).

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

DIFFUSE

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

DISSOLVED OXYGEN

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

ECOSYSTEMS

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

EC DIRECTIVE (Control)

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

ENVIRONMENTALLY SENSITIVE AREA (ESA)

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

EUTROPHIC/EUTROPHICATION

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

FAUNA

Animal life.

FLORA

Plant life.

FLUVIAL

Associated with river processes such as flow and erosion.

FRESHET

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

FRY

Fish which are less than 1 year old.

GAUGING STATION

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

GROUNDWATER

Water contained within pores, cracks and fissures in rocks.

HABITAT

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

HEAD

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

HEADRACE

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

INDICATIVE FORESTRY STRATEGY

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

LEACHATE

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

LEAT

A channel which conveys water to a mill wheel.

LIST I AND LIST II SUBSTANCES

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

- List I substances are considered to be the most harmful. Pollution caused by these must be eliminated.

- List II substances are less harmful and pollution caused by these must be reduced.

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 abstraction of water.

m^3/s

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

MACROINVERTEBRATE FAUNA

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

mm

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

STATUTORY MAIN RIVER

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

Ml/d

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

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

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

PARAMETER

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

PARCOM

A monitoring programme for pollutants selected by the **Paris Com**mission, 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.

TIME LIMITED LICENCE

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

UNCLASSIFIED REACHES

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

WASHLANDS

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

WEIR

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

WETLAND

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

95-PERCENTILE FLOW (Q95)

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