

# RIVER SEVERN - UPPER REACHES CATCHMENT MANAGEMENT PLAN ACTION PLAN JUNE 1995



**NRA**

*National Rivers Authority  
Severn-Trent Region*

## THE NRA'S VISION FOR THE CATCHMENT

*The catchment of the upper reaches of the River Severn is predominantly rural in character, and is an area known for its attractive upland landscape and great natural beauty. Most rivers in the catchment support high class fisheries and provide a diversity of habitats for a wide range of flora and fauna.*

*The catchment is home to around 75,000 people, who depend on the water environment in many ways and value it for the amenities and enjoyment it provides for their local communities. The picturesque and unspoilt countryside within the catchment is also increasingly seen as a tourist attraction.*

*The catchment has an important role far beyond its physical boundaries, and indirectly affects many people who live outside the catchment. One reason is the plentiful high quality water in its rivers and lakes, which is used as a major source of water supply to surrounding areas. Also of note is the fact that the catchment comprises the upper parts of the longest river in Britain. What occurs in these sensitive upper reaches can have an impact downstream for some 350 kilometres.*

The NRA's vision for the catchment is to:

- *safeguard existing high quality water and habitats, and where appropriate work towards enhancing the water environment.*
- *work in an integrated manner towards resolving those issues and problems that have been identified in the plan.*
- *ensure that future demands on the water environment from both within and outside the catchment are planned and managed in a balanced and sustainable way for the benefit of all users.*

Key objectives of this plan are to:

- *ensure proper management of the catchment's valuable water resources.*
- *maintain the highest possible level of protection for the water environment, restore damaged habitats and protect rare and threatened species.*
- *quantify the factors contributing to EC Environmental Quality Standard exceedences, in particular in relation to acidification and metalliferous mining.*
- *improve water quality of the 60 km of rivers where the required longer-term River Ecosystem water quality objective has not already been achieved by 1996.*
- *improve recreational and amenity access to watercourses in the catchment where environmentally appropriate.*
- *improve fisheries by making spawning areas in rivers more accessible to migratory fish, and of a higher quality.*
- *influence the planning processes of local authorities to ensure that development does not adversely impact on, and wherever possible proceeds in a way to benefit, the water environment.*

*The realisation of the NRA's vision will be achieved through a balanced management approach to all activities in collaboration with all users of the catchment. It is our intention to work in partnership with all relevant agencies and representative organisations to promote and achieve an integrated approach to managing the catchment. The plan will ensure required improvements can be carried out, and future demands catered for, in a sustainable manner.*

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# RIVER SEVERN – UPPER REACHES CATCHMENT



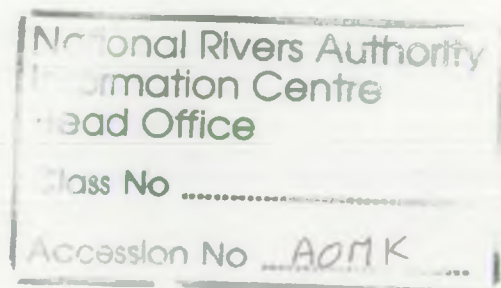
# RIVER SEVERN-UPPER REACHES CATCHMENT MANAGEMENT PLAN

## ACTION PLAN

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# 1. INTRODUCTION

## 1.1 PLANNING FOR THE FUTURE: CATCHMENT MANAGEMENT PLANS

The rivers, lakes, estuaries and coastal waters of England and Wales have never before been subject to such large and rapidly increasing demands from the users of water. Many different uses interact or compete for water and will inevitably come into conflict with one another.

Catchment Management Plans (CMPs) allow the National Rivers Authority (NRA) to manage these interactions and balance competing requirements for the overall benefit of the water environment and its users. The process seeks to realise the environmental potential of a catchment by establishing a sound planning base for the future management of the water system.

The plans set out the NRA's vision for the future of individual river catchments, and seek to create a partnership between public, private and voluntary sectors to achieve a shared objective. It is intended that CMPs (which are themselves non-statutory) will make a positive input to Local Authority Development Plans by emphasising the interaction between land use planning and the water environment. Section 4 outlines how the concerns of the water environment should influence the location and nature of land use change within the catchment.

The CMP process comprises three main stages, each supported by documents as follows:

- *The Consultation Report: This contains an analysis of the issues affecting each catchment, suggested options for their solution, an assessment of catchment uses and resources, and information on targets for the water environment. It forms the basis for public consultation and discussion.*
- *The Action Plan: This details areas of work and investment proposed by the NRA and others, formulated as a result of the consultation process. Timescales, targets and estimated costs are added at this stage.*
- *Implementation of the Action Plan: Progress will be monitored and an Annual Review produced, which reports on progress, examines the need to update the CMP, and rolls forward the detailed actions.*

## 1.2 THE NATIONAL RIVERS AUTHORITY

The NRA was created in 1989 as an independent environmental agency. Its prime purpose is to protect and improve the water environment in England and Wales and to regulate the use of water by industry, agriculture and the private water and sewerage companies.

The NRA's responsibilities cover rivers, lakes, canals and underground waters. It has statutory responsibilities for water quality, water resources, flood defence, salmon and freshwater fisheries, conservation, navigation and recreation. It also has a duty to protect people and property from flooding caused by rivers and the sea. The responsibilities for water quality and fisheries extend into coastal waters.

The NRA is the UK competent authority for approximately 20 European Commission (EC) Directives. It is a non-departmental public body, sponsored by the Department of the Environment (DoE). The Ministry of Agriculture, Fisheries and Food (MAFF) has important policy and funding responsibilities in relation to flood defence and fisheries. The Welsh Office has important responsibilities in relation to the NRA's work in Wales.



The River Severn at Llandinam

The following extract is taken from the NRA's Mission Statement:

*We will protect and improve the water environment by the effective management of water resources and by substantial reductions in pollution. We will aim to provide effective defence for people and property against flooding from rivers and the sea. In discharging our duties we will operate openly and balance the interests of all who benefit from and use rivers, groundwaters, estuaries and coastal waters.*

The NRA has chosen Catchment Management Plans to translate these principles into action. In achieving our aims, we recognise the need to work with local communities, landowners, interest groups, industry and other agencies whose activities and interests include the water environment.



## 2. REVIEW OF THE CONSULTATION PROCESS

### 2.1 METHOD OF PUBLIC CONSULTATION

One of the objectives of Catchment Management Planning is to involve all interested parties in the planning for the future of river catchments. The NRA is therefore committed to the concept of public consultation on all its Catchment Management Plans. Comments and suggestions are welcomed from everyone with an interest in the water environment, ranging from large public organisations to individual members of the public.

Production of the River Severn – Upper Reaches CMP has involved a number of stages since work commenced on the Consultation Report early in 1994. Informal consultation took

place early in the process, during May 1994, with over 40 key external groups. Local authorities, national organisations and other representative bodies were invited to comment on an issues document, which identified and discussed the issues affecting the water environment in the catchment. All comments from this initial consultation were considered and incorporated in the Consultation Report where possible.

The Consultation Report, published in English and Welsh, was launched on 29 November 1994 at the Royal Oak Hotel, Welshpool. This marked the start of the formal consultation period. The Consultation Report concentrated on the

issues in the catchment and the management options for their solution. Delegates at the launch represented a wide spectrum of interests from within the catchment, plus national groups and organisations. The launch was attended by approximately 110 delegates, who all received a copy of the report. Further copies of the report were circulated widely within and outside the catchment to local authorities, environmental groups, business groups, parish and community councils, sport and recreation groups and the public.

A two month consultation period followed, concluding on 3 February 1995. To encourage responses to the Consultation Report during this time we:

- *conducted radio and press interviews on the day of the launch*
- *distributed over 500 copies of the report and a large number of summary documents directly to key groups and individuals*
- *exhibited bilingual displays about the catchment management plan in five libraries throughout the catchment area, County Council Offices and a local leisure centre*
- *placed copies of the report on deposit at eleven council offices throughout the catchment and at a further two libraries; summary documents were also available at these locations*

Members of the NRA's Regional Committees (Regional Fisheries Advisory Committee, Regional Rivers Advisory Committee and the Regional Flood Defence Committee) considered the Consultation Report and the future of the catchment.



Ox-bow on the River  
Severn near Welshpool



## 2.2 RESULTS OF CONSULTATION AND FURTHER ACTION

A total of 83 written responses were received as detailed in Appendix 2. These responses provided useful feedback and many supported the objectives in the report and the concept of catchment management in general. Several organisations indicated their strong support for the concept and the NRA's commitment to manage catchments in an integrated and sustainable way. The NRA's vision for the catchment was shared or fully supported by a number of key organisations.

When responses were received, they were referred to the appropriate NRA departments, for action where necessary. Written replies were sent to all respondents shortly after receipt, and where possible any queries were answered by this initial letter. Depending on the content of the responses further action was then taken as follows:

- *where appropriate, follow-up letters were sent to answer in more detail the points and issues raised*
- *for some responses, telephone discussions took place*
- *meetings were arranged with a number of key organisations and groups*

A series of meetings was set up to which several organisations and groups were invited. These organisations included Water Companies, local authorities, environmental organisations, farming unions, fishing and angling associations, other interest groups such as canoeists, and NRA Regional Committee nominees. The purpose of these meetings was to discuss catchment issues that were of particular concern to the groups involved, and to discuss, formulate and agree management options and actions for the catchment.

## 2.3 SUMMARY OF KEY POINTS

The following provides a summary of the main topics referred to by respondents. The list does not include all comments received but summarises some key points:

- *Support was given to the NRA's views on safeguarding existing high quality waters and habitats and to our views on acidification problems (Issues 1 & 2).*
- *The problem of inadequate rural sewerage and funding provision and extension of public sewerage networks in rural areas was discussed by a number of respondents (Issue 4).*
- *Concern was expressed that there is too little capacity for flood water storage in Clywedog and Vyrnwy reservoirs. This is alleged to contribute to downstream flooding. There is a need for close monitoring of releases (Issue 6).*
- *Concern was expressed on the potential effects of further export of water from the catchment, (eg possible increased bank erosion), and strategic water resource use. The importance of the catchment in terms of water resources and supply was recognised (Issues 5-8, 13).*
- *There was concern over potential impacts of abstraction from groundwater via boreholes (Issue 12).*
- *More emphasis should be given to recreation opportunities for canoeing – many consultees thought that the report had underestimated the existing and potential use of the catchment's rivers for canoeing, and wished for improved access to rivers and better liaison at times when release water is available (Issue 16).*
- *More emphasis should be given to recreation opportunities for rambling/walking and footpath provision. The lack of recognition of the existing and potential level of rambling in the catchment was referred to. Joint ventures would be welcome, and the NRA was urged to build a strong commitment to increase access to rivers in the Action Plan (Issue 16).*

- *The restoration of the Montgomery Canal and its use for recreation and navigation attracted a number of comments (Issue 16, 11).*
- *The proposal to develop and implement a Severn Valley Wetlands strategy was particularly welcomed by environmental groups (Issue 17).*
- *A large number of comments were made on fisheries interests, including illegal fishing, piscivorous birds, improvement of spawning grounds, more emphasis on protection of nursery areas, and steps to improve coarse fish stocks as well as salmon and trout (Issues 18-21).*
- *Support was given to the development of a long term environmental strategy for water level and land use management in the Severn-Vyrnwy confluence area. The importance of achieving a balance/consensus of views between interested parties (including farmers and landowners) was stressed. Farmers would be concerned at any limitations on agricultural activity within the area (Issue 23).*
- *Some respondents have noted a loss of the 'sponge effect' of land in upland areas, due mainly to improved drainage during past decades, resulting in quicker run-off and lower baseflows. Provision of pools giving slow release of water and reinstatement/creation of wetlands should be encouraged. Priority should be given to studies on land use/management changes, and the scale of impact on low flows and peak/flood flows (Issue 26).*
- *The importance of involving landowners at an early stage, for example in habitat creation, leisure activities, footpath creation, was emphasised in several responses.*
- *The use of buffer zones (strips of land alongside watercourses) should be considered in a wider context – this was mentioned by several organisations.*
- *Hydropower should be included as an issue, as although there are currently few schemes in the catchment, there is likely to be some potential for HEP schemes in the future.*
- *There should be more flow and quality monitoring in the catchment, and improved flood warning. (Refer Issues 5 and 24 for flow monitoring and Section 6 for quality monitoring. Improved flood warning in headwaters is dependent on improved technology, and unlikely to be possible within this plan period).*
- *Agricultural pollution was considered a problem by one or two respondents. However, others pointed out that farming is not the only source of pollution, and more reference should be made to run-off of fertilisers/chemicals used by other bodies.*
- *The importance of the archaeological, historic and heritage aspects of the water environment was recognised.*
- *Several organisations, mainly environmental groups, made detailed suggestions for actions to be taken to improve the water environment.*
- *Some comments referred to minor factual errors or omissions, none of which materially affected the plan's findings.*
- *Many respondents kindly provided us with useful facts and information about the catchment which have enhanced the NRA's database.*

Several changes to the issues and options raised in the Consultation Report have been made as a consequence of public consultation. One new issue (hydropower) and a number of modifications to existing issues were identified. These have been incorporated under existing issue headings where appropriate. One issue (Issue 28 – Changes in Local Government Structure) has been dropped as not amenable to constructive action.

We have considered the detailed responses made and have developed the Action Plan in a way which we believe reflects a reasonable balance between the opinions expressed and the need to ensure the plan is feasible.



### 3. OVERVIEW OF THE CATCHMENT

#### 3.1 BRIEF DESCRIPTION OF THE CATCHMENT

The catchment lies across the Welsh/English border and comprises a diverse area within Mid Wales and part of Shropshire, being dominated on its western edge by the Cambrian mountain range. It includes the River Severn and lakes and tributaries from its source in Powys, to where it is joined by the River Perry on the downstream boundary some 6 kilometres to the north west of Shrewsbury. Almost 86% of the total catchment area of 2065 square kilometres lies within Wales, and it comprises a wide variety of attractive landscape types, ranging from the flat low-lying Severn-Vyrnwy flood plain in the east, with isolated border hills, through undulating hills to the moorland plateaux of the Berwyn mountains in the west.

The River Severn covers a distance of approximately 112 km from its source on one of the slopes of Plynlimon to the downstream boundary. From its source it flows south-eastwards

to Llanidloes then north-eastwards until it meets the River Vyrnwy, where it continues in a generally easterly direction. The Severn-Vyrnwy confluence area is one of the major flood plain environments in the catchment, and is of national importance for wading birds and overwintering wildfowl.



Flooding in the Severn-Vyrnwy confluence area

The rivers and canals support high class fisheries and provide habitats for a wide range of flora and fauna. The high standard of water quality, together with the reliable and plentiful quantities of winter water, make this catchment one of the most important in the country for water resources and supply. Llyn Clywedog and Lake Vyrnwy reservoirs are situated near the western edge of the catchment.

Agriculture is the main land use in this predominantly rural catchment. Upland pasture accounts for about a third of the area, woodland approximately 10% (both mainly in the west) and arable farming accounts for 17% of the catchment area.

Settlement generally has focused on the river valleys, in particular the River Severn. Urban development is characterised mainly by market towns and local administrative centres, many with business parks and light industrial estates. These towns and most of the population are located mainly in the eastern and southern parts of the catchment. There is very little major industry.

## 3.2 SUMMARY OF CATCHMENT RESOURCES, USES AND ACTIVITIES

These are described in detail in the Consultation Report. The following are key extracts:-

### 3.2.1 Geology and Hydrogeology

Impermeable mudstones and shales (non-aquifer) dominate much of the catchment. These provide only small quantities of water, and groundwater resources are therefore generally very limited.

There is a limited area in the north east of the catchment where more permeable strata occur which provide important underground water supplies. These rocks include the Permo-Triassic Sandstones, which are found to the east and south east of Oswestry.

### 3.2.2 Hydrology

Annual rainfall varies considerably across the catchment, from over 2500 mm in the western uplands, to only 660 mm at the lowest point just to the west of Shrewsbury. After allowing for evaporation losses and transpiration, the effective rainfall varies from around 1500 mm in the west to less than 200 mm in the lowlands in the east.

River flows in winter reflect the high rainfall and its distribution, with frequent flooding occurring as water accumulates in the flatter vales and around the Severn-Vyrnwy confluence. During dry summers, river flows on upland streams can be very low and unreliable.

### 3.2.3 Water Resources and Abstraction

The catchment is strategically important as both an existing and potential provider of water resources for other parts of the country. Llyn Clywedog, which was built between 1964 and 1967, supports the provision of water supplies to 6 million people as far away as Bristol, and Lake Vyrnwy has supplied water to north west England since the scheme was commissioned in 1892. The flow of the River Severn is regulated to ensure minimum flow needs are met.

The prolific surface water resources are reflected in the volume of surface water licensed abstractions, which at 101,518 Ml/annum are ten times by volume those issued for groundwater (10,879 Ml/annum). The majority (over 90%) is licensed



Clywedog Dam and river

for public water supply, reflecting the strategic importance of the catchment for water resources.

Groundwater abstraction from the small area of major aquifers in the north east of the catchment is important for local public water supply, including the three major groundwater



sources at Kinnerley, Ford and Eyton. The other main public water supply source is from river gravels at Llandinam. A large proportion of the catchment is exempt from the need for licensing for groundwater abstraction.

Five boreholes of the Shropshire Groundwater Scheme are located near the north east catchment boundary. Groundwater from the sandstone aquifer is pumped and discharged to the River Severn to supplement flows during prolonged drought conditions.

Other uses for abstracted water in the catchment include spray irrigation, mineral washing, industrial circulation, fish farming and hydropower.

### 3.2.4 Water Quality and Effluent Disposal

The catchment contains the highest proportion of top grade rivers within the Severn-Trent Region. The 1994 General Quality Assessment (GQA) of water covered approximately 480 km of river and canal, with 92% achieving the category of Good.



Dolanog Falls on the River Vyrnwy

This high quality water provides a perfect basis for a wide range of aquatic habitats and extensive salmonid and cyprinid fisheries, and enables large scale abstraction for drinking water to take place.

However, headwaters of many streams and rivers along the western uplands are affected either by acid run-off due to the combined effect of increased acidic atmospheric pollution and land use change, or by drainage from abandoned metalliferous mines. In some cases, both may be contributing.

Following the translation of longer term River Quality Objectives from the NWC Classification Scheme to the River Ecosystem Classification Scheme (refer Appendix 1), the 1993 data identified 138 km of rivers and canals which failed to achieve their longer term quality objective. Ongoing improvements predict that 47 km will achieve quality objectives by 1996, and planned initiatives will improve a further 60 km by the year 2000. 5 km of river below Newtown and Oswestry (Mile Oak) sewage treatment plants may deteriorate from present class if new development causes a deterioration in effluent quality.

There is a total of 208 consented discharges within the catchment, of which 104 are sewage effluent or sewage system overflows owned and controlled by Severn Trent Water Ltd., 96 are sewage treatment plants in private or local council control, and the remaining 8 discharges are trade effluent.

The principal sewage discharges are from sewage treatment plants serving Llanidloes, Newtown, Welshpool and Oswestry. Most sewerage system storm overflows operate without causing nuisance, although overflows at Newtown, Llanidloes, Llanfair Caereinion and Caersws have given rise to complaint. Only two of the trade effluent discharges are of sufficient significance to present a potential impact to receiving river water quality – at Llanidloes and Oswestry.

Due to the rural nature of the catchment a large proportion of properties are not connected to public sewage treatment plants and dispose of foul sewage by rudimentary septic tank treatment and soakage of effluent into the ground – volumes are generally very small.

During 1994, 82 pollution reports were received and investigated in the catchment; none were identified as being major incidents, 7 as significant and 59 as minor, and 16 unsubstantiated. The largest single type and source of pollutant was agriculture, followed by oil and sewage.

### 3.2.5 Waste Disposal and Mineral Working

The NRA has records of 46 waste disposal sites in the catchment, including landfills, transfer sites and licensed scrap yards. The largest site is the landfill at Bryn Posteg near Llanidloes, on the site of a disused lead mine, which covers some 16 hectares. Leachate production is high, but its collection, treatment and disposal were an integral part of the site's design.

Leachate and contaminated surface water from abandoned tips and long standing scrap yards has been identified as being a problem in some cases. However, the majority of existing solid waste disposal sites are a consequence of the road and urban development programme and are infills of inert solids and building wastes which do not give rise to problems if operated correctly.

There is only limited use of the catchment for mineral working. There are 4 known active quarries, mainly for the extraction of stone for road construction and improvement. Gravel extraction takes place intermittently near the River Severn upstream of Newtown.

A considerable amount of mining took place in the western uplands predominantly between 1850 and 1900 in the search for lead, copper and zinc. There are no active mines at present.

The legacy of this mining activity is numerous abandoned sites covered with mine spoil and underground mineral veins that have been subjected to weathering processes. Drainage from these sites of water containing metals can affect many local streams. The largest abandoned mine is the Fan Mine near Llanidloes, which was the largest lead mine in Europe and covers an area of some 7 hectares. A reclamation scheme is being undertaken to reduce the metals contamination of the Afon Cerist.

### 3.2.6 Agriculture and Forestry

Sheep farming is widespread throughout the catchment but is increasingly dominant in the western uplands. The main river valleys are dominated by dairy farming.

Arable farming covers only 17% of the catchment and is concentrated commercially to the north and east of the River Severn.

Agriculture and the rural economy in general within the catchment has experienced a decline over the past decade. Around 95% of the catchment now benefits from designation by the European Commission as eligible for Objective 5b assistance. Farm development schemes and diversifications into new opportunities eg: food processing enterprises, farm-related tourism, small scale tree planting are therefore likely to increase over the next 5 years.

Approximately 10% of the catchment area is woodland. The forests most likely to have significant effects on the water environment are those on the western headwater catchments, particularly those on base poor bedrock and soils. Acidification of surface waters can be exacerbated by the planting of conifers in these soils. A number of acid sensitive sub catchments have been identified in the western uplands. Future new planting is expected to be on a small scale, although felling of mature stock and restocking is expected to increase substantially over the next few years.



For both agriculture and forestry, there is potential for enhancing and safeguarding the water environment by creating buffer zones adjacent to watercourses. The NRA is keen to promote practices that are likely to result in improved water quality – in respect of agriculture, research on less intensive farming and organic methods is being pursued.

### 3.2.7 Flood Defence

The Severn and its tributaries are prone to regular flooding, with floods of major note in 1946, 1947, 1948, 1960, 1964, 1965 and 1968.



Repairing argae on the River Severn at Haimwood, Llandrinio

Flood defence works were built following the floods in the 1960s to alleviate the risk to property, specifically at Caersws, Meifod and Newtown. A comprehensive system of over 50 km of embankments (known locally as argaes) provide limited protection to over 5,000 hectares of land upstream of the confluence of the Severn and Vyrnwy. This flood plain area provides extensive natural storage for excess flood waters and helps to limit the flows passed further downstream.

Where catchment response times allow, a flood warning scheme operates to lessen the damage from

floods. Warnings are issued by the NRA on the River Severn downstream of Llandinam, and on the River Vyrnwy downstream from Newbridge, Meifod.

A detailed description of flooding problems was first undertaken in 1980, and has been updated several times. A summary of these localised flooding problems was given in the Consultation Report.



Fish pass on the River Severn at Penarth

### 3.2.8 Fisheries

The catchment is characterised by having many high quality and unspoilt fishery habitats, most of which are designated salmonid fisheries under EC Directive (78/659/EEC).

Salmon, trout and grayling dominate in most watercourses, but cyprinids also occur especially in the River Severn. The Montgomery Canal is an EC designated cyprinid fishery throughout its length.

Most of the salmon spawning grounds for the River Severn salmon stocks occur in the catchment, together with salmon rod fisheries primarily in the Rivers Severn and Vyrnwy. Good stocks of wild brown trout also exist, particularly in tributaries such as the Afon Dulas, River Mule, Afon Carno and River Camlad. A number of stillwater trout fisheries are also located in the catchment, most notably Llyn Clywedog and Lake Vyrnwy.

Over 100 km of potentially high quality salmon spawning and nursery areas are inaccessible as a result of obstructions to salmon migration. Fish life is adversely affected by acidification problems which occur in some upland watercourses, most notably the top 10 km of the River Severn, and also the Afon Twrch. The NRA recognises that in some locations there is concern that cormorants and goosanders may be adversely affecting fish stocks.

Most fisheries habitats are of high quality, but unauthorised river works have caused significant damage in some areas.

### 3.2.9 Conservation

The catchment is of high conservation value despite post war land use changes, especially agricultural improvements and afforestation, which have decreased the ecological diversity.

There is a total of 77 Sites of Special Scientific Interest (SSSIs), of which 49 are water-related. These include blanket bog, mires, fen, wet meadow, carr woodland, lakes and the Montgomery Canal. There are also a number of woodlands which have streams or rivers running through them, and four geological sites occur along the sides of streams. A section of the River Severn in the Llandinam area is a proposed SSSI on geomorphological grounds.

The catchment remains a stronghold for otter populations. However, wading bird populations, most notably lapwing and curlew, have suffered declines in recent years through loss of wetland habitats. Dippers may also have declined in some upland acidified streams as a result of poor invertebrate populations. Both flora and fauna diversity are poor in the Afon Cerist, due to heavy metal contamination from old mine workings at Fan. Reclamation works currently underway at the site should improve the situation, and will expose and enhance some of the archaeological features of the site.

### 3.2.10 Landscape, Archaeology and Heritage

The landscape quality is uniformly high, with a variety of landscape types ranging from plateaux to narrow valleys and flood plains.

The catchment is not formally designated as being of landscape value, with the exception of a small area of the Berwyn Mountains which falls within the Snowdonia National Park, and a small area of the Shropshire Hills Area of Outstanding Natural Beauty. The upper Severn valley, the western uplands of Montgomeryshire, the Berwyn Mountains including the Tanat Valley and Lake Vyrnwy, and the border hills to the east of the area have been designated as Special Landscape Areas in the Powys Structure Plan. Areas of Special Landscape Character, as defined in the Shropshire Structure Plan, cover the uplands around Oswestry and the River Severn downstream of the Welsh border.

The Border area and the river valleys have been important in terms of defence, and the area's long history is reflected in a wealth of archaeological sites. Of the 263 Scheduled Ancient Monuments within the catchment, only a small number may be affected by river activities. However, a few are situated close to watercourses or are located in flood plains, and need to be safeguarded. Work is required to improve existing records, particularly for the Severn-Vyrnwy confluence area. Offa's Dyke is an important feature of the catchment area which in some locations runs along the top of the argaes (flood protection banks).

Parts of the catchment, including the Caersws/Llandinam/Llanidloes basin, the Montgomery basin and extensive parts of the Tanat Valley and the Berwyn range, have been identified as areas of Special Historical Landscape by Cadw and the Countryside Council for Wales.



### 3.2.11 Amenity, Recreation and Navigation

Recreational activities in the catchment include angling, canoeing, ornithology, sailing and walking. There are a number of camping and caravan sites on riverside locations, and Clywedog and Vyrnwy reservoirs are used for various informal activities.

The catchment provides a variety of angling opportunities, including salmon fishing on the River Severn and Vyrnwy; brown trout in the smaller tributary streams such as the Afon Dulas, River Mule, Afon Rhiw and River Camlad; stillwater fisheries such as Llyn Clywedog, Lake Vyrnwy and Fownog Pool; and coarse fishing in the Montgomery Canal, River Severn and lower Vyrnwy.

There are few definitive riverside footpaths, and scope exists for collaborative developments to increase river access opportunities, with the co-operation and involvement of landowners and local authorities.

There is a free right of navigation on the River Severn downstream of Pool Quay. This right is currently exercised mostly by canoeists, but access problems can occur. Upstream, no right of navigation exists and use for river boating is dependent on riparian owners' permission. Extensive canoeing does take place in such areas with local access agreements and very little evidence of conflict with other river users.

Human activities such as navigation, angling and other forms of access can put pressure on habitat and wildlife. The relatively unspoilt and scenic nature of the catchment encourages an increasing level of tourism. This is likely to lead to a greater demand for recreational facilities in the future. The management of the catchment to provide a sustainable resource is essential to all users.



Caravan site adjacent to the River Vyrnwy

## CATCHMENT KEY DETAILS

<b>AREA</b>	2,065 km <sup>2</sup>	
<b>POPULATION</b> (estimates from 1991 Census)	Year 1991 2001 (predicted)	Population 74,800 83,000
<b>TOPOGRAPHY</b>	Source of Severn Highest Point Lowest Point	613m (AOD) 741m (AOD) 55m (AOD)
<b>ADMINISTRATIVE DETAILS</b>		Percentage of Plan Area
County Councils	Powys County Council Shropshire County Council Clwyd County Council Gwynedd County Council Dyfed County Council)	79% 14.5% 6% ) ) < 1%
District Councils	Montgomeryshire District Council Oswestry Borough Council Shrewsbury & Atcham Borough Council South Shropshire District Council	Radnorshire District Council Meirionnydd District Council  Glyndwr District Council Ceredigion District Council
National Parks	Snowdonia National Park (< 1%)	
NRA	Severn-Trent Region, Upper Severn Area	
Water Companies	Severn Trent Water Ltd North West Water Ltd Dwr Cymru/Welsh Water	
Internal Drainage Boards	Melverley IDB	Powysland IDB
British Waterways	Montgomery Canal	

## MAIN TOWNS AND LAND USE

Main towns and settlements in the catchment are Oswestry (14,219), Newtown (10,097), Welshpool (5,725), Llanidloes (2,616), Llanfair Caereinion (1,257), Caersws (1,182), Montgomery (1,059), Llanfyllin (1,054) and Guilsfield (1,020).

The main land uses in the catchment are upland pasture/rough grass 33%, arable 17%, grass 12%, woodland 10%.

## WATER QUALITY

Length (km) of river and canal in each component of the General Quality Assessment – 1994.

GENERAL DESCRIPTION	CHEMISTRY GRADE			BIOLOGY	
GOOD	A	288.3 )	443.0	368.1 )	450.5
	B	154.7 )		82.4 )	
FAIR	C	25.5 )	40.5	20.5 )	27.5
	D	15.0 )		7.0 )	
POOR	E	0 )		5.5	
BAD	F	0 )		0	

No of Consented Discharges 208

Comprising:- 104 water undertaker sewage and storm overflows, 96 private sewage works, 8 industrial



## WATER RESOURCES

Average annual rainfall	1,160	mm
Total licensed abstraction	112,397	Megalitres per year
Mean flow of River Severn at Montford	3,660	Megalitres per day
Number of licensed abstractions	351	
of which:-		
Groundwater	239	
Surface Water	112	
Llyn Clywedog	49,924	Megalitres
Lake Vyrnwy	59,666	Megalitres

## FLOOD DEFENCE

Length of Main River in Catchment	277	km
Length of Main River within IDB area	64	km
Length of floodbanks and flood walls maintained by NRA	79	km
No of urban flood alleviation schemes	4	
No of operational sluices/pumping stations	2	
Max. flood drawdown runoff at Llyn Clywedog	171	mm over catchment to dam
Max. flood drawdown runoff at Lake Vyrnwy	140	mm over catchment to dam

## FISHERIES

Length of watercourse designated under EC Directive for Freshwater Fisheries (78/659 EEC).

Salmonid	351.1	km
Cyprinid - rivers	0.	
Cyprinid - canals	40.5	km

## CONSERVATION

Sites of Special Scientific Interest	77	(of which 49 have a wetland interest)
Prime Sites	111	(of which 42 have a wetland interest)
Scheduled Ancient Monuments	263	(of which 48 have a close association with the water environment)

## 4. RELATIONSHIP BETWEEN LAND USE AND THE WATER ENVIRONMENT

### 4.1 LAND USE PLANNING AND CATCHMENT MANAGEMENT PLANNING

Land use has the single most important influence on the water environment. It follows therefore, that land use *changes*, whether from increased urbanisation and other pressures for development, tourism, changing agricultural practices or afforestation, have important implications for the water environment. The impact of land use changes may not always become apparent in the short term. A better understanding of the complex relationship between land use changes and the water environment, and the time scales involved, is therefore essential if we are to succeed in the long term sustainable management of the catchment.

Agenda 21, the international blueprint for sustainable development, identifies the need for an integrated approach to the management of land and water resources. Government planning guidance (e.g. PPG12, PPG23, Circular 30/92 and 68/92) highlights the importance of communication between local planning authorities and the NRA and the relationship between land use and water matters. It is just as important that liaison takes place with other agencies whose policies and actions impinge on the water environment.

The broad objective of catchment management planning is to conserve and enhance the total river environment through effective land and resource management. However, while the NRA is well placed to influence some of the factors affecting the water environment, particularly within the river corridor, it has very little control over the mechanisms which determine land use change on a catchment-wide basis. This is largely the responsibility of local planning authorities (LPAs) through implementation of the Town and Country Planning Acts. Government policies on agricultural subsidies also have an impact on land use, particularly in rural catchments.

The policies in statutory development plans are paramount, in that they set out the framework for land use change and provide the key reference for the determination of planning applications; the NRA encourages the inclusion of policies which reflect its concerns and responsibilities for the water environment.

To provide guidance for local authorities, the NRA issued its "Guidance Notes for Local Planning Authorities in the Methods of Protecting the Water Environment through Development Plans" in January 1994. The current status of local authority development plans within the catchment was summarised in the Consultation Report. One development plan has since been adopted (South Shropshire Local Plan in October 1994).

The NRA's strategic plans for the management of the water environment (CMPs) need to interlink with the LPAs strategic plans for land use (statutory Development Plans).



## 4.2 LAND USE STATEMENTS

The following land use statements give a catchment perspective to documents such as the NRA Guidance Notes referred to above, and are intended to assist local authority planners and others integrate water issues into their decisions and actions. They identify areas and potential uses of land which have particular implications for the water environment within the catchment.

- LU 1** *The NRA will encourage all authorities to adopt a precautionary approach to development which might affect the water environment in this high quality catchment. The effects of development on the water environment should be considered so as to minimise its adverse impacts and maximise potential benefits. In particular, we will work with developers and others to encourage inclusion of environmental enhancements, including integration of existing watercourses and wetland habitats, as part of development wherever appropriate.*
- LU 2** *Full account needs to be taken of the availability and provision of sewerage and sewage treatment facilities in considering the location, extent and timing of new developments. Principal settlements in the catchment currently not served by mains sewerage and where sewage problems or development constraints have been identified include: Aberhafesp, Arddleen, Cefn Coch, Coedway, Dolfor, Forden, Fron Bank/Cilcewydd, Hyssington, Leighton, Llandrinio, Llanfihangel, Llanmerewig, Llanyblodwel/ Nantmawr/ Porthywaen/ Treflach, Maesbury Marsh, Nesscliffe (part), Priestweston, Refail, Sarn, Shrawardine and Queen's Head. Settlements that are sewered but where there are constraints or limited capacity for further development include Caersws/Llanwnnog, Four Crosses, Kingswood, Knockin, Llandyssil, Llansantffraid, Llanymynech/Pant and Montford Bridge. New development in urban/larger settlements such as Llanfyllin, Newtown, Oswestry and Welshpool must be phased with additional treatment provision under the Water Company's capital investment programme.*
- LU 3** *Full account needs to be taken of the availability and provision of water supplies in considering the location and extent of significant new developments. The limited extent of groundwater in the catchment will restrict the amount of development that can be provided for by groundwater resources. Overdevelopment of the catchment's limited groundwater resources must be avoided, so as to ensure environmental damage does not occur. Demand for public water supply is expected to rise by well over 10% by 2021. Areas where there is presently limited scope from groundwater for meeting increased demands include the river gravel areas in the Vale of Powis, and the Alberbury Groundwater Unit in the north east of the catchment. The NRA is seeking to secure an integrated approach by the Water Company to meeting increased demands by conjunctive use of surface and groundwater sources for those areas presently serviced by the Llandinam and North Montgomery distribution systems.*
- LU 4** *The local river corridors (the land linked visually, physically and ecologically to the river) and other wetland habitats need particular consideration. The conservation, fisheries, landscape, heritage and recreational value of such areas needs to be both protected and enhanced. The European Habitats Directive Article 10 highlights the important 'lineal' conservation value of watercourse corridors and 'stepping stone' features such as ponds and wetlands. River corridors are often liable to flood and must therefore be protected from adverse forms of development. In some areas, significant environmental damage has been caused by unauthorised works to combat erosion problems. Most of the river corridors are of high conservation value (also refer LU 5), but major areas to note include:*
- a) *The River Severn from its source to below Welshpool, where the NRA is working on a Severn Valley wetlands project with Montgomeryshire Wildlife Trust to manage existing and create new wetlands. This is to counteract the marked decline of such habitats over the past decade. The upper Severn valley is designated as a Special Landscape Area (SLA) in the Powys Structure Plan. The upper tributaries of the River Severn lie within the Western Uplands SLA, and partly within an area of Special Historic Landscape as identified by Cadw and CCW.*

- b) *The River Severn from Dolwen to Penstrowed, which is a proposed geomorphological SSSI and of high conservation value because of its actively eroding, braided, meandering channel. These features are particularly susceptible to damage from development and unauthorised river works, and need protection.*
  - c) *The Tanat Valley and Vyrnwy areas, which have been put forward for consideration for special protection under the European Habitats Directive. The upper reaches lie within the Berwyn Mountains SLA and within an area of Special Historic Landscape.*
- LU 5** *The Severn-Vyrnwy confluence area and associated flood plain needs protection from development and requires an overall strategy for land use management. The River Severn downstream from the Welsh border is also within an Area of Special Landscape Character as designated by the Shropshire Structure Plan. The confluence area is one of the major flood plain environments in the catchment, covering an area of some 70 sq km, and is of national importance for wading birds and overwintering wildfowl. However, there has been a gradual loss of suitable habitats, which has had serious consequences on these and other species. The NRA, in collaboration with others, is seeking to develop a long term environmental/flood defence strategy to enhance wildlife and manage land use in this area. The development of agri-environmental packages (such as Tir Cymen) for this area is also being explored, and should be encouraged to enable wildlife and agriculture to co-exist.*
- LU 6** *The flood plains of rivers and watercourses in the catchment need protection from development, and development should also be resisted in those areas liable to be cut off at times of flood. The Severn and Vyrnwy valleys have extensive areas of flood plain, particularly in the vicinity of their confluence. Other areas of concern include sites in Aberbechan, Aberhafesp, Abermule, Bettws Cedewain, Churchstoke, Foel, Guilsfield, Llandinam, Llanfyllin, Llangynog, Llanidloes, Llanrhaeadr YM, Meifod, Mid-Wales Airport, Newtown, Oswestry, Penybontfawr, Tregynon, Welshpool.*
- LU 7** *Surface water run-off from development must be controlled in situations where there is a possibility of an adverse impact on the water environment caused by increased rates and volumes of run-off. Run-off may require retardation through use of soakaways, balancing or off-site works. Particular areas of concern include uncommitted development sites in Caersws, Castle Caereinion, Halfway House, Kingswood, Llansantffraid, Newtown, Oswestry, Sarn, Welshpool, West Felton/Queens Head.*
- LU 8** *The upland areas of the catchment (including the western headwaters of many streams and rivers) need particular consideration due to their potential for large scale land use changes that could be brought about, for example, by changing agricultural policies and subsidies (eg. afforestation) and changing energy policies (eg. hydropower, windfarms). Such changes can affect both the quantity and quality of run-off to streams, many of which are high quality salmonid spawning areas and others which are classified as acid-sensitive. The NRA sets a high priority on furthering our knowledge to ensure informed and sustainable land use management of these sensitive upper reaches.*
- LU 9** *The NRA recognises the tourism potential of this high quality and scenic catchment. Its rivers and lakes are likely to play an increasingly important role in tourism and water-based recreation in general. The NRA will liaise with Local Authorities and developers to ensure such developments are sympathetically designed and located to take into account the safeguarding of the water environment, and where possible its enhancement. The development and promotion of water-based recreation facilities such as riverside footpaths and canoeing should take into account the conservation value of the river corridor.*



## 5. ACTIONS

Implementation of the plan is based around the 27 key issues set out below. These were discussed in detail in the Consultation Report and have been modified where appropriate in the light of the consultation responses. Their resolution is considered necessary in order that the plan can be successful in achieving real improvements within the Catchment.

The issues are presented with a number of actions, a target timetable and the identification of responsible parties. Where possible, costs have been outlined for the period covered by the plan. This does not necessarily reflect the total cost of the schemes. This document is produced in good faith, recognising current priorities both in the NRA and other organisations.

The plan will span a five year period and will be reviewed annually.

### KEY

<	Less than
===	Action in the year indicated (numeric entry given if costs known)
U	Unknown at this time
CS	Commercially sensitive
R	No additional costs to annual budgetary provision (recurring or routine)
*	Costs shared between identified bodies
Δ	Activity added as a result of consultation
pa	Per annum
TN	Timing dependent on national water resources strategy actions

A number of actions will require feasibility studies and appraisal of options prior to work commencing. In some cases, depending on the outcome of these studies and investigations, further action may not be required. Any action identified will be subject to funding availability. A number of the projects may take longer than indicated, owing to funding availability and government policy.

### NOTES ON ABBREVIATIONS

AMP	ASSET MANAGEMENT PLAN	LA	LOCAL AUTHORITY
BCU	BRITISH CANOE UNION	LPA	LOCAL PLANNING AUTHORITY
BW	BRITISH WATERWAYS	MAFF	MINISTRY OF AGRICULTURE, FISHERIES & FOOD
CC	COUNTY COUNCIL	MWRT	MONTGOMERY WATERWAY RESTORATION TRUST
CCW	COUNTRYSIDE COUNCIL FOR WALES	MWT	MONTGOMERYSHIRE WILDLIFE TRUST
CLA	COUNTRY LANDOWNERS ASSOCIATION	NFU	NATIONAL FARMERS UNION
CoCo	COUNTRYSIDE COMMISSION	NWW Ltd	NORTH WEST WATER LTD
DBRW	DEVELOPMENT BOARD FOR RURAL WALES	RSNC	ROYAL SOCIETY FOR NATURE CONSERVATION
DoE	DEPARTMENT OF THE ENVIRONMENT	RSPB	ROYAL SOCIETY FOR THE PROTECTION OF BIRDS
DoT	DEPARTMENT OF TRANSPORT	STW Ltd	SEVERN TRENT WATER LTD
EN	ENGLISH NATURE	SWT	SHROPSHIRE WILDLIFE TRUST
FA	FORESTRY AUTHORITY	WCA	WELSH CANOE ASSOCIATION
FE	FOREST ENTERPRISE	WDA	WELSH DEVELOPMENT AGENCY
FUW	FARMERS' UNION OF WALES	WO	WELSH OFFICE
IDB	INTERNAL DRAINAGE BOARD	WOAD	WELSH OFFICE AGRICULTURE DEPARTMENT

No	ISSUE	ACTIONS	RESPONSIBILITY								
			LEAD	OTHER	TOTAL COST (£K)	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	FUTURE
1	Need to safeguard high quality water, water resources and habitats	1.1 Seek additional EC fisheries designations on Rivers Trannon, Clywedog, Rhaeadr, Mule, Iwrch, Cynllaith and Caebitra Brook	NRA		R	===					
		1.2 Identify potential impact of existing catchment uses on surface and groundwater sources	NRA		R 10	3	7				5 year Review
		1.3 Monitor protection of water environment through planning liaison and the application of NRA's regulatory powers	NRA	LPAs	R	===	===	===	===	===	Ongoing
		1.4 Monitor protection of water environment through the implementation of NRA's area conservation and fisheries strategies	NRA		R	===	===	===	===	===	Ongoing
2	Reduction and mitigation of acidification impacts	2.1 Contribute to the development of national NRA Acidification and Forestry Business Plans	NRA		R 2	1	1				
		2.2 Promote NRA Forestry Business Plans (2.1) to influence the control and management of coniferous forests	NRA	FA CC	U	===	===	===	===	===	Ongoing
		2.3 Monitor impacts of acidification on water quality, fish populations and aquatic fauna	NRA		R 75	15	15	15	15	15	Ongoing
		2.4 Investigate and implement instream liming techniques for mitigating acidification impacts	NRA		35	R<5	R<5	<10	<10	<10	



No	ISSUE	ACTIONS	RESPONSIBILITY								
			LEAD	OTHER	TOTAL	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	FUTURE
					COST (£K)						
3	Achievement of longer term Water Quality Objectives (WQOs) and compliance with EC Water Quality Directives	3.1 Monitor completion of land reclamation scheme at Fan Lead Mine	NRA	Powys CC	R 6	2	2	2			
		3.2 Monitor restoration of Montgomery Canal	NRA	BW MWRT	R 5	1	1	1	1	1	Ongoing
		3.3 Monitor investment at Newtown and Oswestry - Mile Oak Sewage Treatment Plants under AMP2 programme	NRA	STW Ltd	R 10 CS	2 ===	2 ===	2 ===	2 ===	2 ===	Ongoing
		3.4 Investigate cause of non-compliance with RE long term WQO and establish plan for improvement of:	NRA								
		(a) Afon Vyrnwy - lower reach			R 5	1	3	1			
		(b) Camlad - lower reach			R <3	2	<1				
		(c) Weir Brook			R <3	2	<1				
		(d) Afon Cain - upper reaches			R <2	1	<1				
		3.5 Identify areas of contaminated land, assess potential for impact on water quality & assess third party proposals for restoration where appropriate	NRA	CC WDA	U	===	===	===	===	===	Ongoing
4	Sewerage and sewage disposal in rural areas	4.1 Identify locations and establish impact of inadequate sewerage & sewage treatment facilities within catchment	NRA	LA STW Ltd	R	===	===	===	===	===	Ongoing
		4.2 Promote policies in Structure and Local Plans to prevent further problems in critical locations	NRA	LA CC	R	===	===	===	===	===	Ongoing
		Δ 4.3 Make detailed assessment of foul sewage disposal proposals for new development within locations listed in Land Use Statement LU2, and any new locations identified in 4.1 above	NRA	LA	R	===	===	===	===	===	Ongoing

No	ISSUE	ACTIONS	RESPONSIBILITY								
			LEAD	OTHER	TOTAL COST (£K)	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	FUTURE
5	Stewardship role for abundant surface waters	5.1 Determine Control Point flows for Upper Reaches of River Severn taking into account downstream needs	NRA	Water Cos Downstream river users	R 30	10	10	10			
		5.2 Construct Upper Reaches Control Point river flow measurement station at or near Dolwen	NRA		170		10	160			
		5.3 Review S.20 Agreement to incorporate provisions for Upper Reaches Control Point taking into account downstream needs	NRA	STW Ltd NWW Ltd	R 10					10	10year Review
6	River regulation & reservoir control	6.1 Update Reservoir Operating Guidelines to take account of changes to River Severn Control Rules	NRA	STW Ltd NWW Ltd	R 10			10			
		Δ 6.2 Investigate scope to reduce large river releases following periods of flooding at Severn/Vyrnwy confluence	NRA	STW Ltd	R 5		5				
		6.3 Review reservoir control curves to take into account changes to configuration of Shropshire Groundwater Scheme and hydropower facilities	NRA	STW Ltd NWW Ltd	R 10		10				
7	Export of water from the catchment	7.1 Determine whether existing use of Lake Vyrnwy Water Bank maximises local benefits and establish scope for reducing winter spillage (see also 6.3)	NRA	STW Ltd NWW Ltd	R 10 U			10			
		7.2 Incorporate demand management and leakage control monitoring of 'external' water companies into River Severn future demand scenarios	NRA	Water Cos	R 10 U		10				
		7.3 Complete appraisals of alternative provisions in NW England to some of public water supply demand currently provided by Lake Vyrnwy	NRA	NWW Ltd	U U						TN



No	ISSUE	ACTIONS	RESPONSIBILITY									
			LEAD	OTHER	TOTAL	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	FUTURE	
					COST (£K)							
8	Future transfer of water using the River Severn	8.1 Continue feasibility studies into use of River Severn water when naturally plentiful to meet demands downstream of catchment	NRA	Water Cos	U						TN	
		8.2 Commence impact appraisals of increased use of medium river flows for new abstractions on existing River Severn lawful users	NRA	River users	R 20	10	10					
		8.3 Programme long-term appraisal of reservoir storage needs to support higher regulated flows in River Severn	NRA	Water Cos	U U					U	TN	
9	Reliability of water supplies in meeting peak demands	9.1 Appraise adequacy of public water supply provision to meet forward peak demand profiles in the catchment	NRA	STW Ltd	R 5 U	5						
		9.2 Secure commitment to improve demand management by meeting economic leakage levels in Ullandam & North Montgomery Distribution Area	NRA	STW Ltd	R 5 U		5					
		9.3 Ensure new options to meet peak demands do not derogate existing uses of surface or groundwater	NRA	STW Ltd River users	R 10				10			
10	Shropshire Groundwater Scheme (SGS): use and impacts	10.1 Consolidate Phase II SGS Operating Rules into Scheme Operational Manual	NRA	SGS Liaison Committee	R 5	5						
		10.2 Monitor impact of scheme through operational or group test pumping of boreholes	NRA	SGS Liaison Committee	R	===	===	===	===	===	Ongoing	
		10.3 Provide alternative water supplies if appropriate under agreed model terms and conditions	NRA		R	===	===	===	===	===	Ongoing	

No	ISSUE	ACTIONS	RESPONSIBILITY								
			LEAD	OTHER	TOTAL COST (£K)	1995/1996	1996/1997	1997/1998	1998/1999	1999/2000	FUTURE
11	Use of River Severn water for Montgomery Canal	11.1 Monitor use of river water fed into the canal system according to Standing Agreement (1988)	NRA	BW	R	===	===	===	===	===	Ongoing
		Δ 11.2 Review use of river water as restoration proceeds to test adequacy of flow controls to minimise unnecessary water losses	NRA	BW MWRT	R 10		5				5
		11.3 Develop operational flow control measures to ensure best use of scarce river supplies when resources are limited (via the Agreement) during droughts (see 6.3)	NRA	BW STW Ltd	R 5			5			
12	Abstractions from river gravels: use & impacts	12.1 Monitor impact of increased abstractions from river gravels at Llandinam on river flows	NRA	STW Ltd	R 5 U	5					
		Δ 12.2 Maintain awareness of legislative change affecting non-water resources impacts of groundwater abstractions. (See also 9.3)	NRA		R	===	===				
		12.3 Ensure use of those gravels supplies reliant on flow augmentation support is matched by explicit reservoir releases and river abstraction provisions	NRA	STW Ltd	10 U				10		
13	Lake Vyrnwy possible future change of use	13.1 Confirm scope of increased use of Lake Vyrnwy to regulate River Severn flows without impacting significantly on supplies to NW England (See also 7.3)	NRA	NWW Ltd	* U						TN
		13.2 Establish optimum use of Lake Vyrnwy as a joint provider of supplies to NW England and of regulated flows to the River Severn	NRA	NWW Ltd STW Ltd River users	* U						TN
		Δ 13.3 Appraise impact of increased use for river flow regulation on downstream river users and on Lake Vyrnwy users and habitats	NRA	NWW Ltd STW Ltd River & lake users	* U						TN



No	ISSUE	ACTIONS	RESPONSIBILITY								
			LEAD	OTHER	TOTAL	1995/ COST (£K)	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	FUTURE
14	Groundwater abstraction licensing exemptions	14.1 Confirm extent of existing problems allegedly attributable to the exemptions	NRA	STW Ltd Private Abstractors Environ. Interests	R 10 U		10				
		14.2 Assess best method to appraise groundwater resources of exempt area	NRA	STW Ltd Environ. Interests	R 10 U		10				
		14.3 Determine balance of evidence in support of existing policy and any need to change it	NRA	STW Ltd Abstractors	R 10 U			10			
15	Protection of rare and threatened species	15.1 Identify key habitat types and species within the catchment and develop and implement objectives for their protection	EN/CCW	NRA	U	===	===	===	===	===	Ongoing
		15.2 Maintain and improve bankside cover for otters	NRA WOAD	Landowners	<10	===	===	===	===	===	Ongoing
		15.3 Develop policy on mink hunting to reduce disturbance of otters	EN/CCW RSNC	Landowners NRA	U	===	===	===	===	===	Ongoing
		15.4 Identify current distribution of alien crayfish species	NRA	MAFF/WOAD	<5	<5					
		15.5 Develop policy on alien crayfish and restrict introductions to the catchment	MAFF WOAD	NRA EN/CCW	U	===	===				
		15.6 Survey and identify conservation requirements for floating water-plantain	EN/CCW NRA	Wildlife Trusts	<5		<5				
		15.7 Identify Black Poplar distribution and develop objectives for the protection and enhancement of the species	EN/CCW NRA	Wildlife Trusts FA/FE	<5		<5				

No	ISSUE	ACTIONS	RESPONSIBILITY								
			LEAD	OTHER	TOTAL COST (£K)	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	FUTURE
16	Increased demand for amenity and recreation opportunities	16.1 Develop new amenity, recreation and fishing facilities on Montgomery Canal	BW/MWRT		U	===	===	===	===	===	Ongoing
		16.2 Develop canoe launches on River Severn 'free navigation', including 'head of navigation' site in Pool Quay area	BCU/WCA NRA	Landowners LAs	30 *		15			15	
	△	16.3 Improve canoe facilities at Newtown for disabled users	NRA LA	WCA DBRW	10 *		10				
	△	16.4 Investigate possibility of extending the Severn Way footpath along the whole of the River Severn in this catchment area	NRA LAs CC	CoCa/CCW Ramblers Assoc.	5		5				
		16.5 Promote and develop waterside footpaths at suitable locations including Hafren Forest, Llanidloes, Newtown, wetland nature reserves and other appropriate sites	NRA LAs CC	FE Wildlife Trusts	30 *			10	10	10	
		16.6 Promote birdwatching facilities at Dolydd Hafren, Coed y Dinas and Severn/Vyrnwy confluence	NRA	CCW/EN RSPB MWT, SWT	10	5		5			
	△	16.7 Improve Riverline service for canoeists by including details of reservoir releases and overflows	NRA		R	===					
	△	16.8 Promote co-operation between canoeists, riparian owners and other river users	BCU/ WCA	NRA Landowners Angling Clubs	R	===	===	===	===	===	Ongoing



No	ISSUE	ACTIONS	RESPONSIBILITY		TOTAL	1995/	1996/	1997/	1998/	1999/	FUTURE
			LEAD	OTHER	COST (£K)	1996	1997	1998	1999	2000	
17	Restoration of damaged habitats	17.1 Restore old and create new wetland habitats	NRA Wildlife Trusts	EN/CCW Landowners WOAD	25	5	5	5	5	5	
		17.2 Develop and implement Severn Valley wetlands strategy	NRA MWT	RSPB CCW	75	50	15	10			
		17.3 Improve riparian and instream habitat Afon Trannon/Cerist	NRA		10	5	5				
		17.4 Improve salmon spawning gravels where appropriate	NRA		<10	<5	<5	<5	<5	<5	
		17.5 Improve riparian and instream habitat on River Morda	NRA		30		15		15		
		17.6 Promote Tir Cymen, Water Fringe Habitats Scheme, Countryside Stewardship and other appropriate schemes in riparian locations	CCW MAFF WOAD	NRA	U	===	===	===	===	===	Ongoing
		17.7 Investigate riparian tree planting and fencing opportunities and implement where appropriate	NRA	Landowners	20		10		10		
		17.8 Develop Regional NRA Policy on invasive weed control, implement on NRA landholdings and encourage others to follow lead	NRA	Landowners	10	<5	<5	<5	<5	<5	Ongoing
		17.9 Recreate and maintain botanical status of Montgomery Canal in off-line nature reserves.	BW/MWRT	EN/CCW	U	===	===	===	===	===	Ongoing

No	ISSUE	ACTIONS	RESPONSIBILITY								
			LEAD	OTHER	TOTAL COST (£K)	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	FUTURE
18	Obstacles to salmon migration	18.1 Construct salmon pass at Pontdolgoch Weir on Afon Garno	NRA		30	30					
		18.2 Investigate possibility of providing access for spawning salmon to the upper reaches of the River Mule	NRA		R	===					
		18.3 Stock rivers above other obstacles with local hatchery reared juvenile salmon and/or transport adult salmon upstream	NRA		40	<10	<10	<10	<10	<10	
		18.4 Investigate viability of providing access for salmon to the River Severn upstream of Felindre Weir	NRA		U					===	
		18.5 Investigate alternative funding for improvement projects in light of diminishing Grant in Aid	NRA		U	===	===	===	===	===	Ongoing
19	Protection and maintenance of native brown trout population	19.1 Safeguard habitats (see Issue 1)	See Issue 1		U	===	===	===	===	===	Ongoing
		19.2 Resolve acidification problems (see Issue 2)	See Issue 2		U	===	===	===	===	===	Ongoing
		19.3 Determine and implement S30 Stocking Consent Policy for brown and rainbow trout in rivers	NRA		R	===	===	===	===	===	Ongoing
		19.4 Protect isolated population of native brown trout in upper reaches of Afon Dulas	NRA		R	===	===	===	===	===	Ongoing
		19.5 Assess present status of native brown trout populations in the catchment	NRA		R 50	10	10	10	10	10	
		19.6 Determine measures to mitigate any declines in river brown trout populations	NRA		U	===	===	===	===	===	Ongoing



No	ISSUE	ACTIONS	RESPONSIBILITY								
			LEAD	OTHER	TOTAL	1995/	1996/	1997/	1998/	1999/	FUTURE
					COST (£K)	1996	1997	1998	1999	2000	
20	Poaching and illegal fishing	20.1 Maintain surveillance and anti poaching patrols by Water Bailiffs	NRA		R 125	25	25	25	25	25	
		20.2 Maintain checks on illegal sales of salmon at major outlets	NRA		R 10	<5	<5	<5	<5	<5	
		20.3 Review Fisheries Bylaws to combat illegal salmon fishing in close season	NRA		U			---			
21	Impact of piscivorous birds on fish stocks	21.1 Assess the population trends and current distribution of cormorants and goosanders in the catchment	RSPB		<5		<5				
		21.2 Monitor impacts of piscivorous birds on local fish stocks where appropriate	NRA	EN/CCW RSPB, NRA	R	---	---	---	---	---	Ongoing
		21.3 Ensure appropriate consultation on applications to control piscivorous birds	MAFF WOAD		R	---	---	---	---	---	Ongoing
22	Prevention of unauthorised and other environmentally damaging river works	22.1 Promote awareness in agricultural community of damaging environmental impacts of unauthorised river works	NRA		R	---	---	---	---	---	Ongoing
		22.2 Enforce Water Resources Act 1991 to prevent unauthorised river works	NRA		R	---	---	---	---	---	Ongoing
		22.3 Notification of Dolwen/Penstrowed geomorphological SSSI on River Severn	CCW		U	---	---				
		22.4 Enforce Fisheries Legislation to protect salmon spawning gravels from unauthorised river works	NRA		R	---	---	---	---	---	Ongoing
		22.5 Promote the use of 'soft' bioengineering works for bankside protection	NRA		U	---	---	---	---	---	Ongoing

No	ISSUE	ACTIONS	RESPONSIBILITY								
			LEAD	OTHER	TOTAL COST (£K)	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	FUTURE
23	Water level management in the Severn-Vyrnwy confluence area	23.1 Develop long term environmental strategy for water level and land use management in the confluence area	CoCo NRA/DB NFU/FUW CLA	Landowners Wildlife Trust EN/CCW	U		===				
		23.2 Develop and implement strategy for flood defence capital and maintenance works in the confluence area	NRA		50	50	===	===	===	===	Ongoing
		23.3 Merge environmental and flood defence strategies to form overall strategy	NRA		<10	<10	===				
		23.4 Identify sites of archaeological importance in the confluence area	Clwyd-Powys Arch. Trust	NRA	<5	<5					
24	Preservation and definition of flood plain	24.1 Press for policies to be included in Development Plans to protect flood plain from development	NRA	LPA	R	===	===	===	===	===	Ongoing
		24.2 Press for policies in Development Plans to remove redundant structures from flood plain	NRA	LPA	R	===	===	===	===	===	Ongoing
		24.3 Install more level and flow gauging stations	NRA		7	7					
		24.4 Carry out ground level surveys and computer modelling	NRA		224		100	124			
		24.5 Update flooding survey for S105 Water Resources Act 1991	NRA		U	===	===	===	===	===	
25	Caravan sites in flood plain	25.1 Monitor inclusion of policies in Development Plans to prevent development of caravan sites in flood risk areas	NRA	LPA	R	===	===	===	===	===	Ongoing



No	ISSUE	ACTIONS	RESPONSIBILITY								
			LEAD	OTHER	TOTAL	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	FUTURE
					COST (£K)						
26	Impact of land use changes including hill land improvements and afforestation, on rates of run-off	26.1 Investigate scale of impact	NRA	LPAs	U		===				
27	Impact of development on the water environment	27.1 Liaise with LPAs and seek adoption of appropriate policies in Development Plans	NRA	LPAs Developers	R	===	===	===	===	===	Ongoing
		27.2 Increase NRA involvement in pre-planning enquiries, development briefs and planning agreements	NRA	LPAs Developers	R	===	===	===	===	===	Ongoing
		27.3 Include environmental enhancement as part of development where appropriate, and press for aftercare programmes	Developers LPAs	NRA DoT WO Riparian Owners	U	===	===	===	===	===	Ongoing
		△ 27.4 Encourage bridge designers to incorporate holes and ledges into new structures for enhancing bird and bat habitats	NRA DoT	LAs RSPB	U	===	===	===	===	===	Ongoing
		△ 27.5 When river gravels are used for construction works, encourage extraction from flood plain areas where compensatory wetlands can be created (subject to Issue 12)	LPAs NRA	Wildlife Trusts	U	===	===	===	===	===	Ongoing
		△ 27.6 Control and monitor economically viable and environmentally acceptable hydropower developments	NRA	LPAs Developers	R	===	===	===	===	===	Ongoing

## 6. ROUTINE WORK OF THE NRA

The NRA meets its responsibilities through day to day operations. In addition to the actions already highlighted in this plan the NRA will continue to undertake routine works to protect and improve the water environment. Most of these activities do not form part of the Catchment Management Plan. They include:

- *Monitoring*
- *Authorising – licences and consents*
- *Enforcement*
- *Operations*
- *Maintenance*
- *Improvements*
- *Liaison*
- *Emergency responses*

For pollution control, an important task is to monitor the aquatic environment and any discharges to it. Water quality is continuously assessed against the aim of achieving compliance with national and European legislation. Regular inspections are carried out at sites such as sewage works, waste disposal sites, industrial premises and farms. The pollution of water is a criminal offence and the NRA will prosecute when necessary. Equally important is the need to rapidly respond to pollution incident reports and to promote pollution prevention practice.

The responsibilities for water resources include licence determination, charging, policing and enforcement. Through these responsibilities an integrated approach is taken that aims to strike a balance between the needs of abstractors and the environment. Abstracting or impounding water without a licence can lead the NRA to prosecute offenders.

Flood Defence activities cover regulation and enforcement, maintenance and emergency response. Regulatory activities include the enforcement of flood defence legislation and bylaws and the determination of consents under it. Routine maintenance includes the clearance of debris from watercourses and the maintenance of channels and flood defences. Emergency response involves the continuous monitoring of weather and river levels to forecast where and when flooding is likely to occur and issuing appropriate warnings. During flood events, defences are monitored and operated.

The NRA works closely with Local Planning Authorities (LPAs) through its planning liaison function. Planning applications are considered in relation to their impact on the water environment and a response is made which reflects any concerns of the NRA. Local, Structure and Regional Plans are all carefully considered.

The NRA is responsible for maintaining, developing and improving fisheries. These duties include enforcement of fisheries law, scientific monitoring of fish stocks, fish rearing and stocking, fish rescues and advice to the general public. The NRA also manages many recreational sites and has a general duty to promote water based recreation and amenity activities. In addition, the NRA has a duty to protect and enhance conservation interests in all of its operational and regulatory work, which is achieved through its Environmental Assessment procedures.



## 7. FUTURE REVIEW AND MONITORING PROGRAMME

The NRA will be jointly responsible, with other identified organisations and individuals, for implementing this Action Plan. Progress will be monitored and reported annually by the NRA to all the key partners and other interested parties. The first Annual Review will be due in August 1996. The period between major revisions will normally be five years.

The Annual Review will take the form of a short progress report and will:

- *examine the need to update the Catchment Management Plan in the light of changes in the catchment.*
- *compare actual progress with planned progress, and explain the reasons for any changes to the content or timing of individual actions.*
- *report on other matters, including any legislative and classification scheme changes, affecting the Catchment Management Plan.*
- *roll forward the detailed actions.*



Lake Vyrnwy and dam

## APPENDIX 1: NOTE ON NEW RIVER WATER QUALITY SCHEMES

Two new schemes for the reporting and management of river water quality were introduced in 1994. The new schemes will replace the National Water Council (NWC) Scheme, which was first introduced in the late 1970s. In May 1994, the River Ecosystem (RE) use of the Statutory Water Quality Objectives (WQOs) was introduced by *The Surface Waters (River Ecosystem) (Classification) Regulations 1994*. At the same time the NRA introduced the General Quality Assessment (GQA) Scheme.

WQOs will be used for long term planning and target setting for the use of the river. The GQA classification will be used to make periodic assessment of overall water quality in order to monitor geographical trends and trends over time.

Until WQOs are formally established by legal notice served by the Secretary of State (and therefore exist on a statutory basis), they will be applied on a non-statutory basis through translation of River Quality Objectives (RQOs) from NWC classes to appropriate RE classes with target dates. These new non-statutory RQOs will form the basis from which to develop WQOs.

Five uses have been proposed for rivers under the WQO scheme, of which the River Ecosystem (RE) use is the first to have been introduced. The five uses include: River Ecosystem (general river health); Special Ecosystem (for example SSSI); Abstraction for Potable Supply; Agricultural/Industrial Abstraction; and Watersports.

Five classes have been established for the RE use:

Class RE 1:	Water of very good quality (suitable for all fish species).
Class RE 2:	Water of good quality (suitable for all fish species).
Class RE 3:	Water of fair quality (suitable for high class coarse fish populations).
Class RE 4:	Water of fair quality (suitable for coarse fish populations).
Class RE 5:	Water of poor quality (which is likely to limit coarse fish populations).
Unclassified:	Water of bad quality (in which fish are unlikely to be present), or insufficient data available by which to classify water quality.

The introduction of WQOs will require full public consultation, and the timetable will be set by the Government. CMPs will provide the framework within which the NRA can implement the new system, and we will use the Annual Review as well as other approaches to inform you of progress on this matter.



## APPENDIX 2: RESPONSES TO THE CONSULTATION REPORT

The following organisations and individuals sent in written responses to the Consultation Report. The NRA gratefully acknowledges all comments received.

B P Barnett	Ministry of Agriculture, Fisheries & Food
Bausley with Criggion Community Council	Montgomery Waterway Restoration Trust
Birmingham School of Canoeing	Montgomeryshire District Council
British Canoe Union (Local Access Officer)	Montgomeryshire Wildlife Trust
British Canoe Union (Regional Access Officer)	D H Morgan
British Canoe Union (West Midlands)	National Farmers Union (North Wales Region)
J F W Bryon	National Farmers Union (West Midlands Region)
Cadw	North West Water Ltd
Caersws Community Council	K Osborne
Campaign for the Protection of Rural Wales	Oswestry Borough Council
A C Carlile (MP)	D Perry
J Carroll (Bishop's Castle Town Council)	D Puddepha
R Churchill	Ramblers' Association (Shropshire Area)
Churchstoke Community Council	Ramblers' Association (Powys)
M E Clayton-Jenkins	Rapid Runners Canoe Club
Community Council of Shropshire	Red Ridge Centre
Council for the Protection of Rural England	Royal Commission for Ancient & Historical Monuments in Wales
Country Landowners Association	Royal Society for the Protection of Birds
Countryside Commission (Midlands)	Rural Development Commission
Countryside Council for Wales (Mid Wales Region)	Severn Fisheries Consultative Council
Countryside Council for Wales (North Wales Region)	Severn Navigation Restoration Trust
Darlach Angling Association	Severn Trent Water Ltd
Drummond Outdoor	Shrewsbury Canoe Club
English Heritage	Shropshire County Council
English Nature	Soil Association
Farmers' Union of Wales	Soil Survey & Land Research Centre
Forest Enterprise	South Shropshire District Council
Forestry Authority (West Midlands Conservancy)	Sports Council for Wales
Friends of the Earth (Newtown, Oswestry & Shrewsbury Branches)	Sports Council (West Midlands Region)
J Gleave	I Trant
Glyndwr District Council	UK Irrigation Association Ltd
Government Office for the West Midlands	University of Birmingham
Inland Waterways Association	Wales Tourist Board
Institute of Chartered Foresters	Welsh Canoeing Association
Institution of Civil Engineers	Welsh Canoeing Association/Bethania Adventure Centre
Llandinam Community Council	Welsh Office
Llanwddyn Community Council	Welsh Office Agriculture Department
D R Lovell	Welshpool Canoe Club
Meifod Community Council	West Midlands Regional Forum of Local Authorities
Melverley Internal Drainage Board	White Swan Piscatorials
Melverley Parish Council	Wyre Forest Canoe Club
Midlands Amenity Societies Association	

## APPENDIX 3: GLOSSARY

<b>ABSTRACTION</b>	The removal of water from any source, either permanently or temporarily.
<b>ABSTRACTION LICENCE</b>	An authorisation granted by the NRA to allow the removal of water from a source of supply.
<b>ACIDIFICATION</b>	The detrimental effect of acid rain on soils and freshwater.
<b>AMP2</b>	An acronym for the second Asset Management Plan produced by the Water Companies for the Office of Water Services (OFWAT). It sets out the water industry investment programme for the period 1995 to 2000.
<b>AQUIFER</b>	A porous water-bearing underground formation of permeable rock, sand or gravel capable of holding significant quantities of water.
<b>ARGAE</b>	Flood embankment.
<b>CONFLUENCE</b>	The point at which two rivers meet.
<b>CYPRINID FISH</b>	Coarse fish belonging to the carp family, eg. roach, dace and bream.
<b>EC DIRECTIVE</b>	A type of legislation issued by the European Commission which is binding on Member States in terms of the results to be achieved but which leaves to Member States the choice of methods.
<b>FLOOD PLAIN</b>	Land adjacent to a watercourse that is subject to flooding.
<b>LEACHATE</b>	Liquid emanating from solid matter.
<b>MAIN RIVER</b>	The watercourses shown on the statutory 'Main River maps' held by NRA and MAFF. The NRA has permissive powers to carry out works of maintenance and improvement on these rivers.
<b>ML/a</b>	Megalitres per annum (one Megalitre is equal to 1 million litres or approximately 220,000 gallons).
<b>PISCIVOROUS</b>	Feeding on fish.
<b>SALMONID FISH</b>	Game fish of the Salmon family, for example, trout and salmon.
<b>SCHEDULED ANCIENT MONUMENT (SAM)</b>	The key sites nationally for archaeology, designated by the Secretary of State for National Heritage, through English Heritage and Cadw. Statutory; designated under the Ancient Monuments and Archaeological Areas Act 1979.
<b>SSSI</b>	Sites of Special Scientific Interest. The best examples of the national heritage of wildlife habitats, geological features and landforms, designated by English Nature and the Countryside Council for Wales. Statutory; notified under the Wildlife and Countryside Act 1981.
<b>SUSTAINABLE DEVELOPMENT</b>	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
<b>WATER QUALITY OBJECTIVE (WQO)</b>	The level of water quality that a river should achieve in order to be suitable for its agreed uses.
<b>WETLAND</b>	An area of low lying land where the water table is at or near the surface for most of the time, leading to characteristic habitats.



TELEPHONE THE EMERGENCY HOTLINE TO REPORT ALL ENVIRONMENTAL INCIDENTS, SUCH AS POLLUTION, POACHING AND FLOODING, OR ANY SIGNS OF DAMAGE OR DANGER TO OUR RIVERS, LAKES AND COASTAL WATERS. YOUR PROMPT ACTION WILL HELP THE NRA TO PROTECT WATER, WILDLIFE, PEOPLE AND PROPERTY.

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