

catchment management plan



RIVER SEVERN UPPER REACHES second annual review July 1996 - June 1997



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AMGYLCHEDD
ENVIRONMENT
AGENCY

River Severn Upper Reaches Catchment Management Plan (CMP)

Previous CMP Documents

River Severn Upper Reaches Catchment Management Plan (CMP)
Consultation Report - November 1994

River Severn Upper Reaches Catchment Management Plan (CMP)
Action Plan - June 1995

River Severn Upper Reaches Catchment Management Plan (CMP)
First Annual Review July 1995 - June 1996

These documents, including this second Annual Review, are available in English and Welsh.

If you or your organisation need further information or copies of any of the documents please contact:

The Environment Planner
Environment Agency, Midlands Region
Upper Severn Area
Hafren House, Welshpool Road
Shrewsbury
Shropshire SY3 8BB

Tel: (01743) 272828
Fax: (01743) 272138

The following documents also relating to the River Severn catchment are available from the above address:

River Severn Lower Reaches CMP Consultation Report summary leaflet
River Severn Lower Reaches CMP Action Plan
River Severn Lower Reaches CMP First Annual Review - March 1997
Middle Severn Consultation Report, Local Environment Agency Plan - April 1997

Environment Agency Management Contacts:

Head Office	Midlands Regional Office	Welsh Regional Office
Rio House	Sapphire East	Abacus House
Waterside Drive	550 Streetsbrook Road	St Mellons Business Pk
Aztec west	Solihull	St Mellons
Almondsbury	Birmingham	Cardiff
Bristol BS12 4UD	B91 1QT	CF3 0LT

Tel: 01454 624 400 0121 711 2324
Fax: 01454 624 409 0121711 5824

01222 770088
01222 798555

Foreword

The River Severn Upper Reaches Catchment Management Plan (CMP) Action Plan, published in June 1995, set out a five year programme of work to be undertaken to protect and enhance the water environment over the next five years. This second Annual Review of the plan reports on progress made by the Environment Agency and others since July 1996.

The Environment Agency is committed to integrated environmental planning and is building on the strengths of the CMP process in its new Local Environment Agency Plans (LEAPs). Work will start in 1998 on the River Severn Upper Reaches LEAP with the Consultation Report being available at the end of that year.

I am pleased to report that good progress has been made in the catchment addressing many of the issues raised in the plan, reflecting the commitment of all those involved. I look forward to continuing to work together over the coming year.

Dr J H Kalicki
Upper Severn Area Manager
Midlands Region

Environment Agency
Information Centre
Head Office

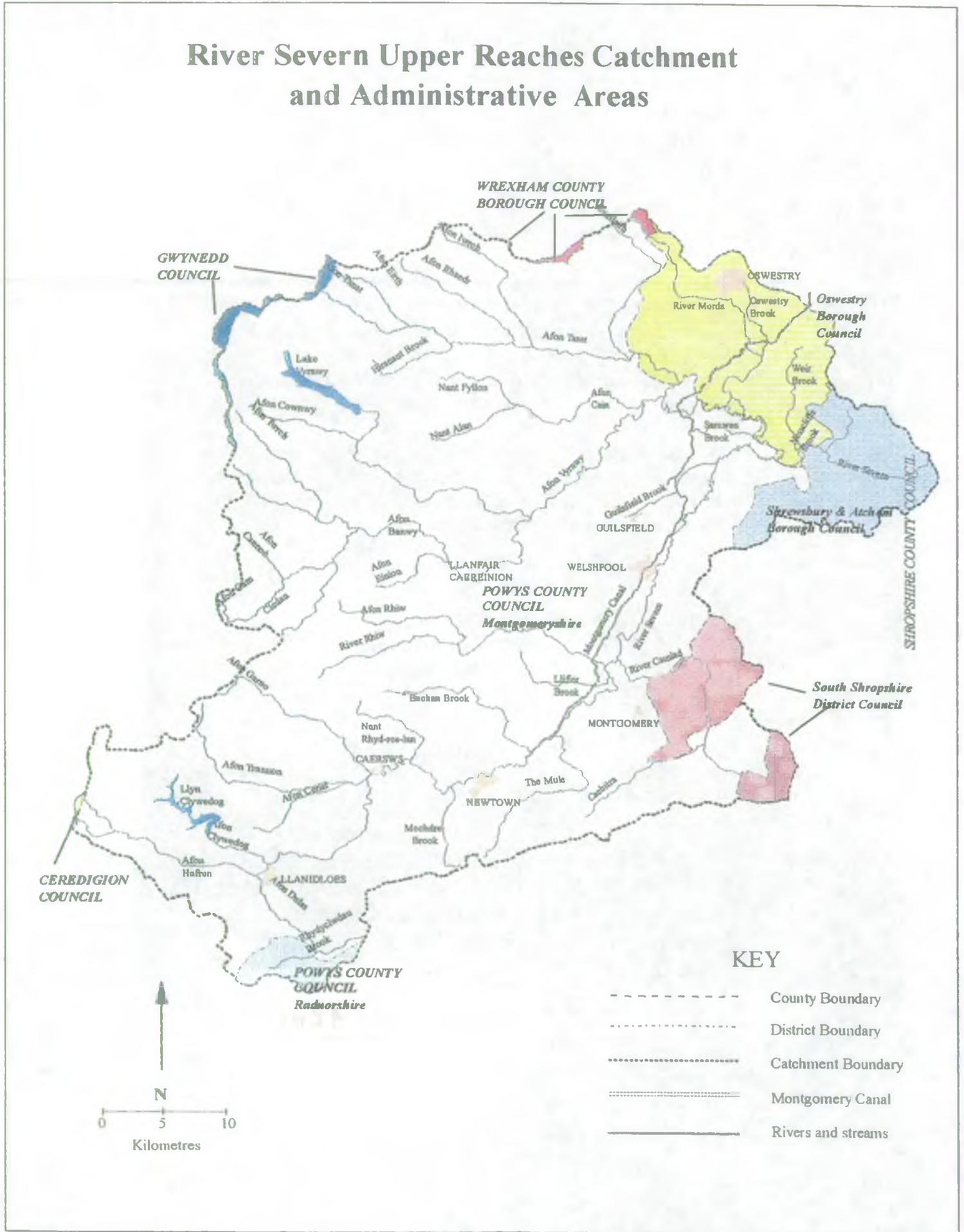
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Map of the Catchment

River Severn Upper Reaches Catchment and Administrative Areas



EXECUTIVE SUMMARY

This second year of the Action Plan has seen good progress made towards protecting and improving the water quality, water resources and natural habitat in the catchment.

Of the 69 actions planned for the 1996 - 1997 year, including ongoing actions, progress has been made on 68, of which 2 were completed, and 6 additional actions were brought forward and started. The outstanding action is referred to in Action 22.3 page 32. Many of the actions have involved organisations working in collaboration with others. Two new issues have been raised in the catchment, and these are considered further on page 4 and pages 37 and 38.

Of particular note is the completion of the wetland sites at Pwll Penarth, Newtown and at the New Cut Argae as part of the Severn Valley wetlands project. Pwll Penarth was formally opened by Professor David Bellamy during the 1997 Festival of the Countryside. The New Cut site involved the purchase of land by the Agency, enabling the long term protection of conservation interests in part of the Severn Vyrnwy confluence area.

There has been further development of the Severn Way long distance footpath with new sections completed from the source to Llanidloes and from Newtown to Welshpool. Significant progress has been made on a strategy for the long term enhancement of the environmental interests in the Severn Vyrnwy confluence area, led by the Countryside Commission. There was National television coverage ('Countryfile') of the Agency's work towards the eradication of Giant Hogweed in the catchment.

There was successful liming work at Clywedog Reservoir, alleviating low pH problems in the lake, and habitat improvement works on the River Morda and Tanat were carried out.

The Van Lead Mine Contaminated Land Reclamation Scheme has resulted in improved water quality and biology in the Afon Cerist.

It is disappointing to report that any future progress on the proposed geomorphological SSSI on the Upper Severn in the Llandinam area now looks unlikely. This in turn has weakened the Agency's efforts to protect this important part of the river through its own powers.

The tables in Section 4.3 form an integral part of this review, and should be referred to for a summary of progress on each action.

CONTENTS

	Page No
- Foreword	(i)
- Map of-Upper Severn Catchment	(ii)
- Executive Summary	(iii)
1. Vision for the Upper Severn Catchment	2
2. Introduction	3
3. Summary of Progress	9
4. Actions Update	11
5. Future Reviews	39
Appendices	
Appendix 1 Current status of Local Authority Development Plans	40
Appendix 2 Pollution Incident Data 1996-1997	41
Appendix 3 Fisheries surveys and fish stockings undertaken in the catchment	42

1. 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 Environment Agency'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.*
- * *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 Agency's vision will be achieved through a balanced approach to the management of the catchment. It is our intention to work in partnership with all relevant agencies, organisations and interested individuals 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.

2.0 INTRODUCTION

This is the second Annual Review to be produced for the River Severn Upper Reaches Catchment Management Plan. It follows on from the Action Plan produced in June 1995 and the First Annual Review produced in June 1996 by the Environment Agency. The review deals with the water environment only and covers the period July 1996 - June 1997.

Monitoring the implementation of identified actions is an important part of the CMP process and this is achieved by Annual Reviews. In the CMP process four annual reviews were normally undertaken prior to producing a further Consultation Report as part of the five year planning process. Due to the requirement to produce a Local Environment Agency Plan (LEAP) to plan for all the Agency's responsibilities, this process is likely to be brought forward for the River Severn Upper Reaches. A third Annual Review will be produced for the coming year and in 1998 work will commence on the LEAP. LEAPs have a broader environmental remit and will consider issues associated with land, air and water.

In this the second year since the publication of the CMP Action Plan, progress has been made on 68 of the 69 actions planned. A number of very notable achievements have been made by the Agency and in partnership with other organisations. In addition two new issues have been raised in the catchment. These are considered further in Section 2.2 and 4.2. The integrated planning process takes an open approach and seeks to create a sense of ownership of our environment, so that environmental risks can be minimised and benefits secured. Your involvement in this process is welcomed. Your comments are sought on progress to date, the new issues raised and indeed on your perception of the continuing appropriateness of identified actions.

2.1 A 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 demarcation of the catchment 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 confluence with the River Perry. 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.

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. 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, and in particular the valley of 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.

2.2 Assessment of the Catchment and Major Changes During 1996 - 1997

One purpose of this Annual Review is to assess the relevance of the activities in the Action Plan and report significant changes in the catchment area. This review should be read in conjunction with the River Severn Upper Reaches Action Plan (June 1995) and the First Annual Review. Changes occurring over the last year are highlighted below; in addition two new issues have been introduced which reflect changes in the catchment.

- a) **New Issues - Summary.** For full details on the new issues see pages 37 and 38 at the end of the actions tables.

Sheep Dips. Concern has been raised over the increased use of synthetic pyrethroid sheep dips in the catchment, due to their high toxicity to invertebrate life. Several incidents have been reported where stretches of river have been reported to have significantly reduced invertebrate life. With this in mind work is now being drawn up to assess the impact of sheep dips in the water environment .

Reduced flow from the Llanforda Water Treatment Works (Oswestry.) North West Water are currently undertaking a programme of filter bed refurbishment to reduce water leakage through the beds. At present this leakage water together with other waste process water is discharged to the River Morda, controlled by a consent issued by the Environment Agency. It is anticipated that a reduction in this discharge will have a significant effect on the available flow in the River Morda which in turn is used to dilute the effluent discharged by Mile Oak Sewage Treatment Works. This could result in the failure of the River Quality Objective for the River Morda downstream of the sewage works.

- b) **Issue Update - Liming of Clywedog Reservoir**
Issue 2 Action 2.3 and 2.4.

Llyn Clywedog is one of the prime trout fisheries in mid Wales, hosting several national and international flyfishing tournaments each year and providing sport for up to 10,000 local and visiting anglers each year. The fishery is managed by Llanidloes and District Angling Club who rear stock fish in cages in the lake under the guidance of Dyfi Valley Trout Farm.

A significant proportion of the catchment area of the reservoir is afforested as part of the Hafren Forest which was planted 40-50 years ago and is now entering the harvesting phase. This particular land use combined with the nature of the geology and soils of the area makes Llyn Clywedog susceptible to the problems of surface water acidification.

Effect of Acidification

In recent years, studies of the water quality of the inflowing streams have shown that the Afon Biga and Afon Llwyd exhibit symptoms of periodic acidification associated with high rainfall and surface water runoff. During these times levels of acidity and aluminium increase significantly. On many occasions water quality conditions considered to be toxic to fish have been observed in both of these streams.

Coinciding with the onset of harvesting the Hafren forest, there have been increased incidence of excessive mortalities in the trout rearing cages and areas of the lake near to the inflow of the Biga and Llwyd have fished extremely poorly. There has been apparent correspondence between periods of heavy rainfall and observed mortalities and it is likely that the poor quality of water entering the lake is responsible. The increased losses of fish and poor performance exert an increasing economic pressure on the fishery and if unchecked could threaten the continued existence of this recreational asset.

Trial Liming Work Already Undertaken

Limestone, consisting almost entirely of calcium carbonate, is the neutralising agent most commonly used to mitigate acidification. In addition to chemically improving the water by raising pH levels, increased calcium concentrations allow fish to better resist the physiological damage associated with acidified water. Preliminary experiments carried out on the fish rearing cages in conjunction with Dyfi Valley Trout Farm, whereby sacks of powdered limestone were suspended in the cages, demonstrated benefits in terms of reduced mortalities, but once the fish had been stocked they were still subject to the vagaries of water quality fluctuations in the lake.

In autumn 1996 a trial liming of the Biga was carried out to see if it was possible to influence the quality of the lake by treating the different streams with crushed limestone. Members of the angling club introduced a total of 20 tonnes of limestone to the Biga at times of high flow over a period of several weeks. Initial results were encouraging, with elevated pH, calcium concentrations and hardness observed in the Biga downstream of the treatment point and, more importantly in the lake itself. An interesting feature of the results was the speed with which the lake appears to mix, with increased calcium levels and pH recorded at all sampling points around the lake within a few days of treatment. Since this initial success, liming of the Biga has continued through the winter of 96/97 and water quality in the reservoir has been maintained at an acceptable level for the fishery. Mortalities in the rearing unit have remained low and sport in the reservoir has so far been of high quality, especially in the inflow areas.

It is intended to continue liming the inflowing streams to Clywedog Reservoir with the aim of improving water quality, and maintaining the fishery and recreational asset of the area. This work will need to be carried out in partnership with the local Angling Clubs.

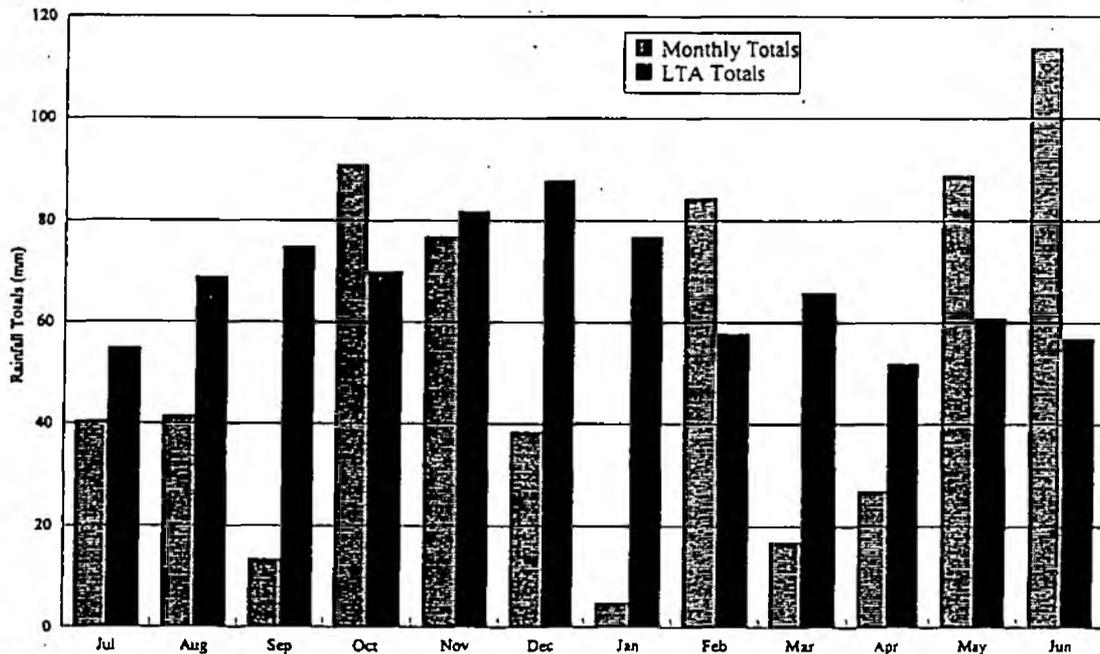
c) **Planning and Development**

The local Government changes as outlined in last year's Review are now fully operational. The updated status of Local Authority Development Plans is given in Appendix 1. In March 1997 the Agency published "Policy and Practice for the Protection of Floodplains." This document encourages Local Authorities to adopt sustainable policies with regard to the flood plains.

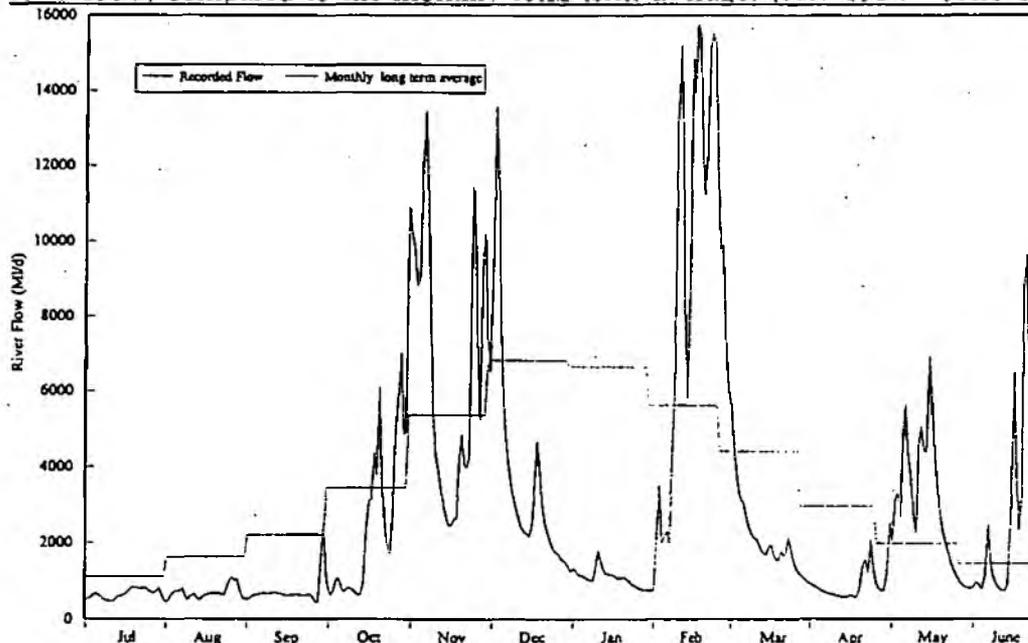
d) **The Drought of 1996**

The review year was extremely dry, yet culminated with one of the wettest Junes on record. This is reflected in the rainfall data chart and the hydrograph for the flow in the River Severn at Montford Bridge below. No requests were made under the Shropshire Groundwater Scheme to provide alternative water supplies during 1996/97.

The chart below shows the monthly rainfall totals (July 1996 - June 1997) at Welshpool compared with the long term average (July 1961 - June 1990)



The graph below shows the flow in the River Severn at Montford Bridge (July 1996 - June 1997) compared to the monthly long term average. (July 1954 - June 1995)

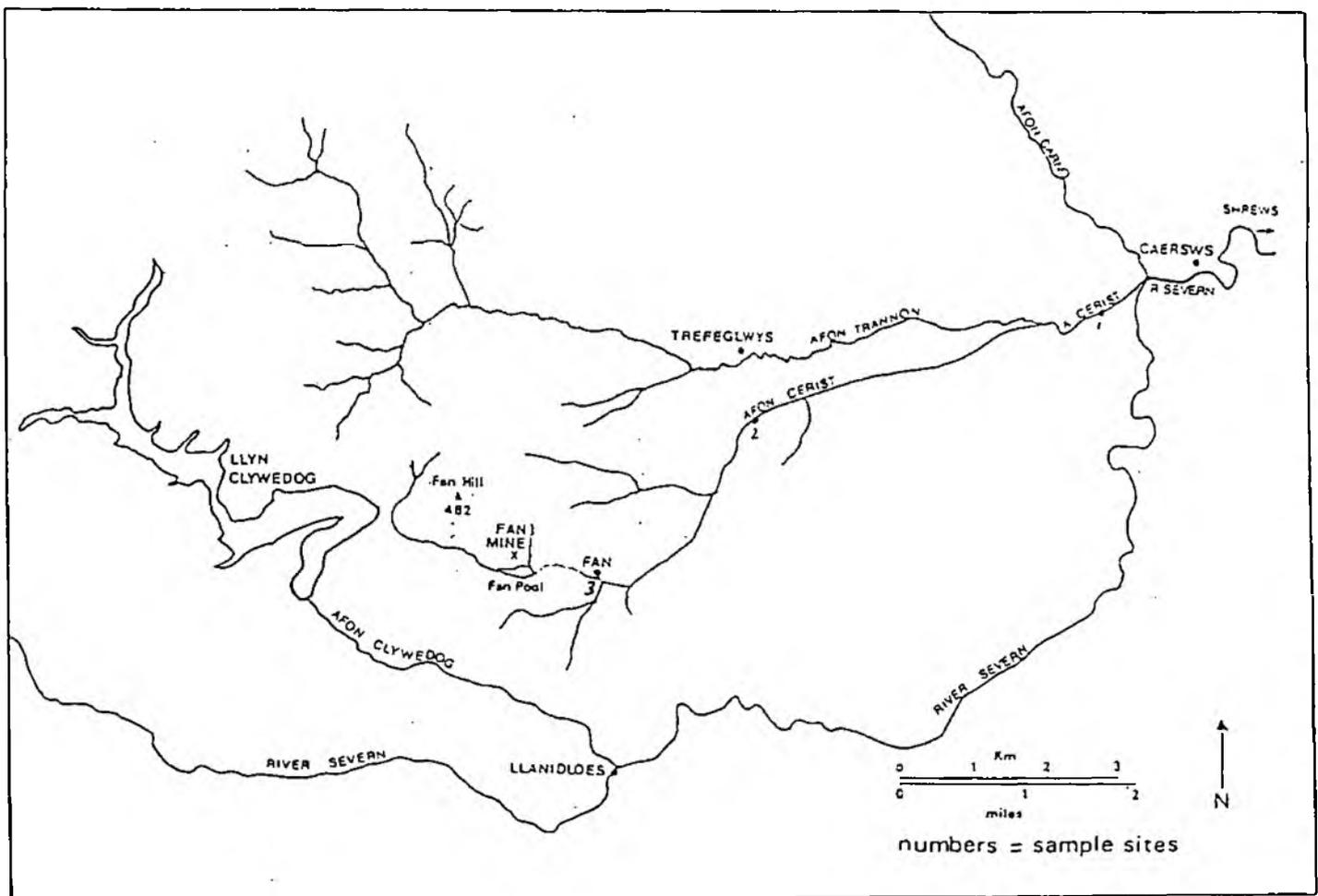


d) **Van Lead Mine Contaminated Land Reclamation Scheme - yields environmental improvements.**

The legacy of the Van Lead Mine resulted in large, uncovered, contaminated spoil heaps which had been eroded by surfacewater runoff causing high concentrations of metals in the Afon Cerist that flows through the site.

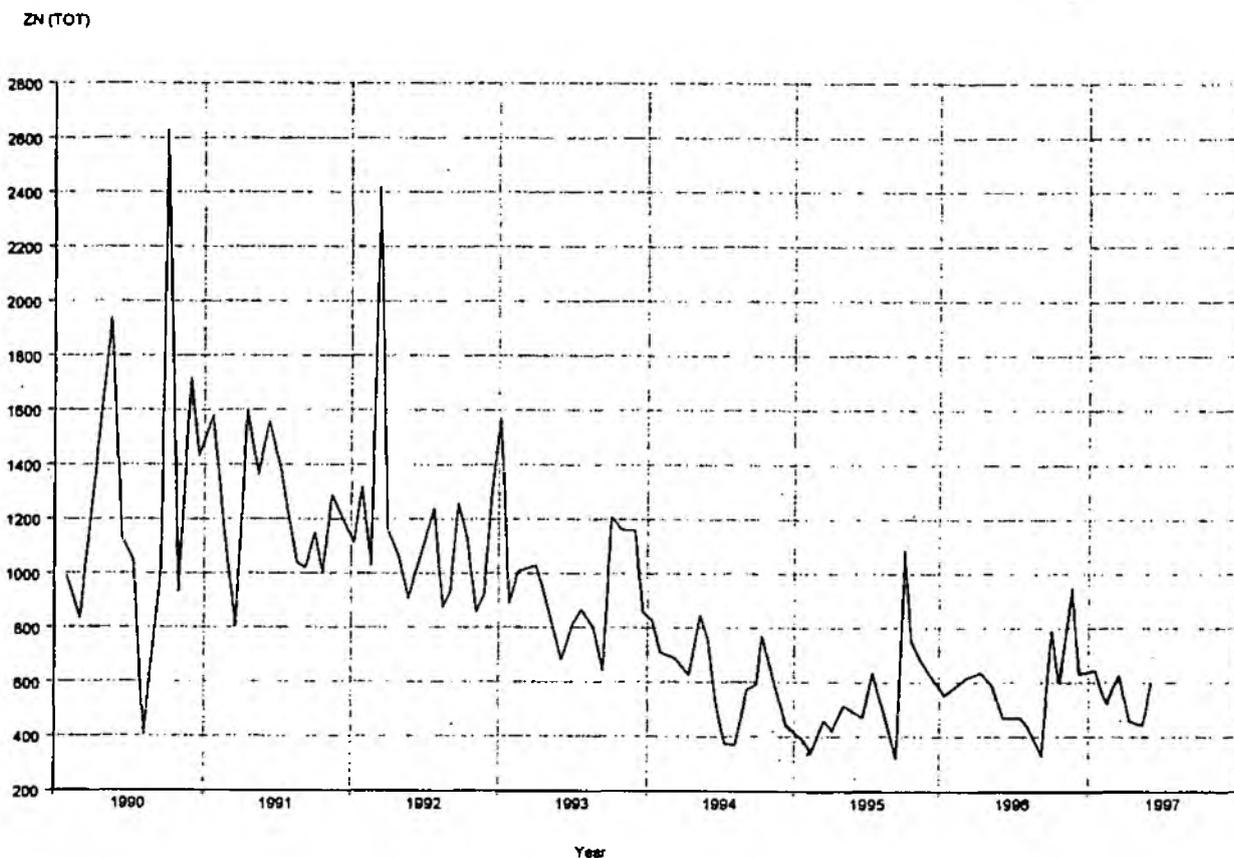
Water quality, biology and fisheries interests in the Afon Cerist have historically been affected by these high concentrations of metals. A land reclamation scheme was started in mid 1993 and completed in early 1995. This work included covering the spoil heaps with an impermeable layer, diverting the watercourse around the contaminated area and installing a wetland treatment system for emerging contaminated ground water.

The location of the Van Lead Mine site and associated watercourses.



To monitor the effects of the reclamation scheme the three existing sampling points were supplemented by new points specific to the scheme. The graph below shows the monitoring results for total zinc at one of the established sample points on the Afon Cerist, downstream of the reclamation site. An overall decline in the total zinc concentration can be seen since work commenced on the scheme in 1993.

Total Zinc concentration (microgrammes per litre) in the Afon Cerist (at the Van Road Bridge) 1990 - 1997.



In addition to the water quality monitoring, biology and fisheries surveys have also been carried out with encouraging results. A number of brown trout have been caught and an improvement in invertebrate life from 'good' to 'very good' has been recorded. Following the completion of Aberystwyth University's assessment of the wetland treatment system, collaborative work with Powys County Council to improve lagoon 1 by provision of additional biomass was undertaken. Assessment of opportunities to improve lagoon 2 are currently being discussed with Powys County Council. The implementation timetable will be dependant on the scale of work required and the cost.

3.0 SUMMARY OF PROGRESS

Considerable progress has been made on a number of issues within the plan.

There are 27 issues highlighted in the plan with a total of 109 actions over the 5 year plan period. Of 69 actions planned for this year progress has been made in 68 and 2 have been completed. 6 actions not scheduled for this year were brought forward and have been started. The outstanding action has seen no progress being made this year, and any further progress now seems unlikely (see Issue 22, Action 22.3, page 32). Further details can be found in the Action Tables on pages 13 - 36.

3.1 Notable Achievements and Disappointments

Notable achievements:-

- Completion of wetland sites at Pwll Penarth, Newtown and at the New Cut Argae as part of the Severn Valley wetlands project. Pwll Penarth was formally opened by Professor David Bellamy during the 1997 Festival of the Countryside. The New Cut site involved the purchase of land by the Agency enabling the long term protection of conservation interests in part of the Severn Vyrnwy confluence area.
- Further development of the Severn Way long distance footpath with new sections completed from the source to Llanidloes and from Newtown to Welshpool. Extensive waymarking has also been undertaken.
- Significant progress, led by the Countryside Commission, on a strategy for the long term enhancement of the environmental interests in the Severn Vyrnwy confluence area, and on a strategy for the Agency operations in the same area.
- National television coverage ('Countryfile') of the Agency's work towards the eradication of Giant Hogweed in the catchment.
- Successful liming work at Clywedog Reservoir, alleviating low pH problems in the lake which had given rise to trout mortalities and poor fishing.
- Instream and riparian habitat improvement works on the River Morda and Tanat.
- Current metre flow measuring at Llandinam, both upstream and downstream of the Severn Trent Water boreholes, has been undertaken at appropriate flow conditions to establish the amount of water 'lost' in the river as a result of the water company abstraction from the river gravels. The company have submitted an application for a consent to drill a fourth production borehole at this site with a proposal to also increase the rate of abstraction. This data will be used when considering further abstractions from the River Severn.
- New Sewage treatment plant schemes for Knockin and Arddleen are to be completed by 1998. New consents to discharge have been issued by the Environment Agency.
- Severn Trent Water Ltd. have achieved a significant reduction in leakage levels in the area during 1996/1997

There have been some disappointments:-

- Future progress on the proposed geomorphological SSSI on the Upper Severn in the Llandinam area now looks unlikely. This in turn may weaken the Agency's efforts to protect this important part of the river through its own powers.
- Maesbury Marsh identified as a priority problem area with inadequate sewerage resulting in pollution. Regrettably Oswestry Borough Council (OBC) have withdrawn funds for a feasibility study in 1997/98.
- An unregistered population of signal crayfish was found in the Dolanog area. This can cause potential problems for the native crayfish populations.

3.2 Summary of the Environment Agency's routine activities within the catchment:

In addition to the progress reported, the Agency has undertaken a variety of day to day activities to protect and improve the water environment. This routine work includes:

- * Water Quality - Enforcement and routine monitoring work.
(April 1996-March 1997.)
 - Responded to 132 pollution incidents.
 - Carried out 373 sewage works inspections (Private and Water Company STW)
 - Carried out 74 industrial site inspections.
 - Carried out 26 inspections of contaminated land and waste disposal sites.
 - Carried out 111 farm visits.
 - Performed 204 inspections of combined sewer overflows (CSO) and other sewerage problems.
 - Undertook 451 river sites inspections.
 - Issued 31 warning letters.
 - Obtained and analysed 2,288 chemical samples (July 1996 - June 1997).
 - Obtained and analysed 212 biological samples (July 1996 - June 1997).
- * Water Resources - Licence Determination, Monitoring and Enforcement
(July 1996 - June 1997).
 - Carried out 24 enforcement visits.
 - Sent 2 warning letters.
 - Initiated 1 prosecution for overabstraction.
 - Investigated 5 incidents of low/no flows.
 - Issued 8 new abstraction licences.
- * Fisheries and Conservation (July 1996 - June 1997)
 - Carried out 7 fish surveys at 44 sites in the catchment
 - Attended 5 fish kills.
 - Stocked 46,000 salmon (smolt and fry) in the catchment.
 - Completed 7 River Habitat Surveys on the River Camlad.
- * The Environment Agency works closely with local planning authorities through its planning liaison function, commenting on Planning Application consultations and proposals associated with Local Development Plans.

- * Flood defence activities cover regulation (including issuing of land drainage consents), enforcement, maintenance, emergency response and flood warning.
 - Issued 26 Land Drainage Consents.
 - Issued 14 Yellow Flood Warnings
 - Cleared material from an 80m stretch of the River Vrynwy between the Canal aqueduct and Llanymynech. This material had been affecting the rating curve at a nearby gauging station which is critical for the Flood Warning System.

Appendix 2 gives the pollution incident report for 1996 -1997.

Appendix 3 gives further details of the fisheries surveys and salmon stocking carried out in the catchment.

4.0 ACTIONS UPDATE

The following Action Plan tables have been reproduced from the Action Plan (June 1995). The tables have been updated to show progress and any changes that have occurred since the Action Plan was published. Progress for each action is summarised in the column on the right hand side.

4.1 Additions and Alterations to the Plan Table

Due to the evolving nature of the Action Plan, some changes are inevitable as a result of the past year's activities.

Some routine actions form part of the everyday protection policies of the Agency. Where applicable, progress has been reported on these issues. In subsequent reviews however, these activities will receive a reduced profile as CMPs and their successor documents LEAPs become increasingly issue-led.

There have been some amendments to issues and actions and this was highlighted in the First Annual Review. In some instances the issue became more focused, and the actions changed accordingly. These amended issues are shown in the Actions Table and a footnote is provided to remind the reader of the changes that occurred and why. Further details about these amendments are found in tables 5, 6, 7, 8, 9, 13 and 14.

4.2 Issues and new issues

The issues are presented with a number of actions, a target timetable and the identification of responsible parties. Whilst every effort has been made in both the Action Plan and Annual Review to reflect the current priorities and cost of schemes, it must be recognised that these have been developed within existing economic and political constraints. Progress will depend on the resources available and recognising the competing priorities of all organisations involved. The new proposed issues are to be found at the end of the Action Tables pages 37 and 38. Any comments on the new issues would be gratefully received.

4.3 Action Plan table

The following tables report on progress for the catchment. The key to use with these tables is given below:

Notes and abbreviations

¹ 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
EA	ENVIRONMENT AGENCY	SWT	SHROPSHIRE WILDLIFE TRUST
EN	ENGLISH NATURE	WCA	WELSH CANOE ASSOCIATION
FA	FORESTRY AUTHORITY	WDA	WELSH DEVELOPMENT AGENCY
FE	FOREST ENTERPRISE	WO	WELSH OFFICE
FUW	FARMERS' UNION OF WALES	WOAD	WELSH OFFICE AGRICULTURE DEPARTMENT
IDB	INTERNAL DRAINAGE BOARD		

KEY

<	Less than
===	Action in the year indicated (numeric entry given if costs known)
U	Unknown at this time
C	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.
C	Capital expenditure

¹AMP2 = Asset Management Plan 2 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. AMP3 will set out the water industry investment programme for the period 2000 - 2005

Issue 1. Need To Safeguard High Quality Water, Water Resources and Habitats

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
1.1 Seek additional EC fisheries designations on Rivers Trannon, Clywedog, Rhaendr, Mule, Iwrch, Cynllaith and Caebitra Brook	Environment Agency		R						Area submissions were made 1995/96 and are awaiting Regional action.
1.2 Identify potential impact of existing catchment uses on surface and groundwater sources	Environment Agency		R 10	7				5 Year Review	Work has been carried out on the modelling phase for groundwater sources which is due for completion Sept 97. Maps will be produced later.

Note: In addition to actions 1.1 and 1.2 the following routine, ongoing work has been carried out throughout the year and forms part of the Agency's day to day activities in working towards protecting our water environment

- 1.3 Monitor protection of water environment through planning liaison and the application of the Agency's regulatory powers.
- 1.4 Monitor protection of the water environment through the implementation of the Agency's conservation and fisheries strategies.

Issue 2. Reduction and Mitigation of Acidification Impacts

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
2.1 Contribute to the development of national EA Acidification and Forestry Business Plans	Environment Agency		R2	1					Agency review of all previous NRA business plans has been undertaken together with an active involvement in the review of the Forestry Business Plan.
2.2 Promote EA Forestry Business Plans (2.1) to influence the control and management of coniferous forests.	Environment Agency	FA CC	U 5	—	—	—	—	Ongoing	Outcomes from Forestry Business Plan are: i) Improve forestry industry awareness of water issues. ii) Improve Agency staff awareness of forestry industry impacts. (Training has been carried out)
2.3 Monitor impacts of acidification on water quality, fish populations and aquatic fauna.	Environment Agency		R75	15	15	15	15	Ongoing	An All-Wales acid waters survey due to be published shortly. Fish populations surveys carried out on Afon Twrch and Upper Reaches of River Severn at Afon Bawny.
2.4 Investigate and implement instream liming techniques for mitigating acidification impacts.	Environment Agency		35	3	<10	<10	<10		Liming trials carried out in partnership with Llanidloes Angling Club on Afon Biga inflow into Clywedog Reservoir. pH levels have risen, fish mortalities reduced and angling success has improved.

Issue 3. Achievement of Longer Term Water Quality Objectives (WQOs) and Compliance with EC Water Quality Directives

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
3.1 Monitor completion of land reclamation scheme at Fan Lead Mine	Environment Agency	Powys CC	R6	2	2				Water quality, biology, and fisheries monitoring of Afon Cerist downstream of site, and water quality monitoring of wetland treatment facility for contaminated water continued.
3.2 Monitor restoration of Montgomery Canal	Environment Agency	BW MWRT	R5	1	1	1	1	Ongoing	River Perry to Aston Lock section completed in September 1996. Dissolved oxygen levels in this stretch have increased due to extra flow, monitoring shows water to be of good quality. Stretch linking Maesbury and Llanymynech dependent on lottery funding, bid to be submitted October 1997.
3.3 Monitor investment at Newtown and Oswestry - Mile Oak Sewage Treatment Plants under AMP2 programme	Environment Agency	STW Ltd	R10 CS	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	Ongoing	Programme for work in place.
3.4 Investigate cause of non-compliance with RE long term WQO and establish plan for improvement of: (b) Camlad - lower reach (d) Afon Cain - upper reaches	Environment Agency	R<3 R<2	2 1	<1 <1					b) Camlad - considerable work to investigate problems. d) River Cain - Extensive biological and chemical monitoring, biology shows no improvement and chemical now includes synthetic pyrethroids. ADAS have undertaken a Farm Waste Management Plan initiative in the catchment.
3.5 Identify areas of contaminated land, assess potential for impact on water quality and assess third party proposals for restoration where appropriate	Environment Agency	CC WDA	U	5	<u> </u>	<u> </u>	<u> </u>	Ongoing	Methodology for site assessment developed with Welsh Region. Initial 5 assessments to produce information on resource requirements. It is estimated that it will cost £1k per site assessment. This is to be reviewed at the end of 1997.

Issue 4. Sewerage and Sewage Disposal in Rural Areas

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
4.1 Identify locations and establish impact of inadequate sewerage and sewage treatment facilities within catchment	Environment Agency	LA STW Ltd	R	=====	=====	=====	=====	Ongoing	<p>a) Maesbury Marsh identified as priority problem area with inadequate sewerage resulting in pollution and nuisance. Regrettably, Oswestry Borough Council (OBC) have withdrawn funds for a feasibility study in 1997/8. Agency will seek to have this reinstated into the 1998/9 programme.</p> <p>b) Queens Head - Discussions have taken place between OBC and STW Ltd regarding the provision of a sewerage scheme to deal with existing problems and proposed development.</p>
4.2 Promote policies in Structure and Local Plans to prevent further problems in critical locations	Environment Agency	LA CC	R	=====	=====	=====	=====	Ongoing	Ongoing process through planning liaison, policies promoted where appropriate.
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.	Environment Agency	LA	R	=====	=====	=====	=====	Ongoing	<p>a) Knockin - Consent has been issued for a new STP, scheme to be completed by January 1998.</p> <p>b) Llansantffraid - Scheme due to start late 1997 to replace existing facilities.</p> <p>c) Llanidloes, Penygreen Road sewerage scheme completed.</p> <p>d) Arddleen, some problems encountered crossing the Montgomery Canal with scheme. To go ahead.</p>

Issue 5. Stewardship Role for Abundant Surface Waters - Review of River Severn Regulation Controls and Reservoir Operations

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
5.1 Review requirement for/and if needed construct Upper Reaches Control point river flow measurement at Dolwen.	Environment Agency	Water Cos Downstream river users	C190*	20	170				'PHABSIM' ¹ project completed providing information on the relationship between changes in flow regime and available habitat for salmon. New site for flow gauge now agreed with construction of gauge planned for year 1999/2000.
5.2 Investigate scale of flooding problems and impact of existing flood drawdown guidelines for Llyn Clywedog and Lake Vyrnwy.	Environment Agency		C10		10				Still under consideration.
5.3 Review reservoir control rules and operating guidelines for Llyn Clywedog and Lake Vyrnwy as result of 5.1 and 5.2 above and also to take account of any changes to the River Severn Control Rules.	Environment Agency		C10		10				Still under consideration.

* The same cost estimate will apply

¹ PHABSIM - Physical Habitat Simulation Method - This is a well established method which has been used worldwide to quantify ecological effects on instream river habitats due to changes in flow regimes. This method is based on extensive hydrological measurements and ecological observations along a representative stretch of river.

Note: As stated in last years Annual Review, Issue 5 and Issue 6 would merge to focus on the Review of River Severn Regulation Control and Reservoir operation. This is shown in Issue 5 above.

Issue 6 As noted in the First Annual Review Issue 6 has merged with Issue 5 to form the new Issue 5 which is entitled "Stewardship Role for Abundant Surface Waters - Review of River Severn Regulation Controls and Reservoir Operation".

Issue 7. Export of Water from the Catchment: Review of use of Lake Vyrnwy

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
7.1 Establish optimum use of Lake Vyrnwy as a joint provider of supplies to NW England and of regulated flows to the River Severn.	Environment Agency	STW Ltd NWW Ltd	R10		10				Agency project being undertaken to investigate options for increasing available resources for river regulation from Lake Vyrnwy.
7.2 Assess further potential for use of Lake Vyrnwy as a regulating reservoir including the environmental impact of such proposals.	Environment Agency	NWW Ltd	U					TN	Same as 7.1 above.

Note: As stated in last years Annual Review, this issue is an amended issue combining the old Action 7.1 and 7.3 and Issue 13.1. The above Issue 7, Export of Water from the Catchment focuses on a review of the use of Lake Vyrnwy. The proposal to increase the use of Lake Vyrnwy as a regulating reservoir could have potential environmental impact.

Issue 8. Future Transfer of Water Using the River Severn

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
8.1 Assess options for and impacts of potential future transfers of water out of the Severn Catchment.	Environment Agency	Water Cos River users	U					TN	No progress made other than PHABSIM studies on River Severn and Vymwy.

Note: As stated in last years Annual Review Actions 8.1, 8.2 and 8.3 have merged and the new action to complement the Issue is given in 8.1 above.

Issue 9. Water Supplies in Llandinam and North Montgomery Distribution Area

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
9.1 Appraise adequacy of public water supply provision to meet future peak demands in the catchment.	Environment Agency	STW Ltd	R 5 U	5					Consent issued to Severn Trent Water Ltd. to investigate a fourth ground water abstraction source in the River gravels.
9.2 Secure commitment to improve demand management by meeting economic leakage levels in Llandinam & North Montgomery Distribution Area.	Environment Agency	STW Ltd	R 5 U	5					Severn Trent Water Ltd. have achieved a significant reduction in leakage levels, average and peak demands in these distribution areas during 1996/1997.
9.3 Ensure new options to meet peak demands do not derogate existing uses of surface or groundwater.	Environment Agency	STW Ltd River users	R 10			10			Information is being provided by Severn Trent Water to the Agency to monitor demands and leakage patterns.

Note: Issue 9 focuses on Llandinam and North Montgomery Distribution Area. The amended issue title 'Water Supplies in Llandinam and North Montgomery Distribution Area' reflects this.

Issue 10. Shropshire Groundwater Scheme (SGS) : Use and Impacts

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
10.1 Consolidate Phase 2 SGS Operating Rules into Scheme Operational Manual.	Environment Agency	SGS Liaison Committee	R						SGS operational manual review to include the newly constructed Phase 3 component.
10.2 Monitor impact of scheme through operational or group test pumping of boreholes.	Environment Agency	SGS Liaison Committee	R	==	==	==	==	Ongoing	Statutory monitoring duties have been met. A detailed report covering operational pumping of Phase 2 during 1995 was produced.
10.3 Provide alternative water supplies if appropriate under agreed model terms and conditions.	Environment Agency		R	==	==	==	==	Ongoing	No requests made during 1996/97.

Issue 11. Use of River Severn Water for Montgomery Canal

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
11.1 Monitor use of river water fed into the canal system according to Standing Agreement (1988).	Environment Agency	BW	R	—	—	—	—	Ongoing	Ongoing. It is anticipated that telemetry will be installed at key locations before March 1998.
11.2 Review use of river water as restoration proceeds to test adequacy of flow controls to minimise unnecessary water losses.	Environment Agency	BW MWRT	R 10	5				5	Monitoring ongoing, and in 1996 showed no increase of water use over previous years. Agreed quantities may need reviewing as requirements for nature reserves change.
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).	Environment Agency	BW STW Ltd	R 5		5				British Waterways proposals to install telemetry to improve monitoring and control discussed. British Waterways urged to action this work.

Issue 12. Abstractions from River Gravels: Use and Impacts

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
12.1 Investigate impact of proposed increased abstractions from river gravels at Llandinam.	Environment Agency	STW Ltd	R 5 U	R					Current meter gauging of flow in River Severn was carried out when conditions were suitable. May need to consider more permanent flow measuring gauge.
12.2 Δ Maintain awareness of legislative change affecting non-water resources impacts of groundwater abstractions. (See also 9.3).	Environment Agency		R	—					Done. No legislation change yet.

Note 12.3: As stated in last years Annual Review action 12.3 - "Ensure use of those gravels supplies reliant on flow augmentation support is matched by explicit reservoir releases and river abstraction provisions" was deleted and is now covered by action 12.1, focusing the augmentation philosophy on Llandinam.

Issue 13. Lake Vyrnwy Possible Future Change of Use :

As outlined in the previous Annual Review this issue has merged with Issue No.7. Please see page 18 for further detail.

Issue 14. Groundwater Abstraction Licensing Exemptions

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
14.1 Carry out study to determine the extent of existing problems caused by the exemption, including recommendations for any change in policy and how best to assess groundwater resources.	Environment Agency	STW Ltd Private Abstractors Environ. Interests	R 30		20	10			Preliminary in-house report written outlining the problems - further work needed.

Note: The same cost estimate is given

Note: As stated in last years Annual Review Actions 14.1, 14.2 and 14.3 were merged to give Action 14.1 as detailed above. It is felt that this consolidated action more effectively deals with the issue.

Issue 15. Protection of Rare and Threatened Species

ACTION	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
15.1 Identify key habitat types and species within the catchment and develop and implement objectives for their protection.	EN/CCW	Environment Agency	U	==	==	==	==	Ongoing	CCW have completed phase 1 surveys and have notified Tanat bat sites as a Special Area of Conservation (SAC). Midlands Region Biodiversity strategy produced by Agency highlighted key species responsibilities including otters and crayfish.
15.2 Maintain and improve bankside cover for otters.	Environment Agency WOAD	Landowners	<10	==	==	==	==	Ongoing	Riparian fencing/buffer zones undertaken on Rivers Tanat and Morda.
15.5 Develop policy on alien crayfish and restrict introductions to the catchment.	MAFF WOAD	Environment Agency EN/CCW	U	==					Unregistered population of signal crayfish found in Dolanog area. Steps currently underway to eradicate.
15.6 Survey and identify conservation requirements for floating water-plantain.	EN/CCW Environment Agency	Wildlife Trusts	C<5	<5					MWT will continue upgrading their records on distribution in the catchment.
15.7 ▲ Identify Black Poplar distribution and develop objectives for the protection and enhancement of the species.	EN/CCW Environment Agency FA/FE	Wildlife Trusts	C<5	<5	<5				Surveys and DNA testing completed. Approximately 30 new trees identified. Further surveys and planting planned for 1997/98.

Note: The following Actions were completed in 1995/96:
 15.3 - Develop policy on mink hunting to reduce disturbance of otters
 15.4 - Identify current distribution of alien crayfish species.

Issue 16. Increased Demand for Amenity and Recreation Opportunities

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
16.1 ▲ Develop new amenity/recreation and fishing facilities on Montgomery Canal.	BW/ MWRT		U	=====	=====	=====	=====	Ongoing	2nd phase of restoration completed Sept 1996 from Perry Aqueduct to Aston Locks. Lottery heritage funding currently being sought to extend the canal to Newtown. Severn Way now follows canal towpath from Newtown to Welshpool.
16.3 ▲ Improve canoe facilities at Newtown for disabled users.	Environment Agency LA	WCA DBRW	C10 *						Deferred beyond 1997/98 - no GIA funding available. WCA to seek relevant permissions.
16.4 ▲ Investigate possibility of extending the Severn Way footpath along the whole of the River Severn in this catchment area.	Environment Agency LAs CC	CoCo/CCW Ramblers Assoc.	C5	5					Source to Llanidloes and Newtown to Welshpool sections completed. Remaining lengths should be completed by September 1997.
16.5 Promote and develop waterside footpaths at suitable locations including Hafren Forest, Llanidloes, Newtown, wetland nature reserves and other appropriate sites.	Environment Agency LAs CC	FE Wildlife Trusts	C30 *						Project completed (footpaths now in place at Hafren Forest, Pwll Penarth and Llanidloes).
16.6 Promote birdwatching facilities at Dolydd Hafren, Coed y Dinas and Severn/Vymwy confluence.	Environment Agency	CCW/EN RSPB MWT, SWT	C10		5				Project now complete. Bird hide installed at Pwll Penarth May 1997.
16.8 ▲ Promote co-operation between canoeists, riparian owners and other river users.	BCU/ WCM	Environment Agency Landowners Angling Clubs	R	=====	=====	=====	=====	Ongoing	Ongoing. No specific problems in 1996/97.

Note: Actions 16.2 - Develop canoe launches on River Severn 'free navigation', including 'head of navigation' site in pool Quarry and 16.7 - Improve Riverline service for canoeists by including details of reservoir releases and overspills. have been completed. Refer to previous Annual Review.

Issue 17. Restoration of Damaged Habitats

ACTION	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
17.1 Restore old and create new wetland habitats.	Environment Agency Wildlife Trusts	EN/CCW Landowners WOAD	C25	5	5	5	5		Three acre wetland site adjacent to River Severn created in flood defence capital works borrow pit at New Cut argae.
17.2 Develop and implement Severn Valley wetlands strategy.	Environment Agency MWT	RSPB CCW	C71	10	10				Pwll Penarth wetland site completed (£10K) and opened by David Bellamy May 1997.
17.3 Improve riparian and instream habitat Afon Trannon/Cerist.	Environment Agency	10	C5						Instream habitat improvements achieved through changes in weed cutting regime.
17.4 Improve salmon spawning gravels where appropriate.	Environment Agency		C25	<5	<5	<5	<5		New spawning gravels created on River Morda.
17.5 Improve riparian and instream habitat on River Morda.	Environment Agency		C30	15		15			Riparian fencing work and gravel spawning areas completed.
17.7 Investigate riparian tree planting and fencing opportunities and implement where appropriate.	Environment Agency	Landowners	C20	10		10			Riparian fencing work carried out on Rivers Tanat and Morda.
17.8 Develop regional EA Policy on invasive weed control, implement on EA landholdings and encourage others to follow lead.	Environment Agency	Landowners	C20	<5	<5	<5	<5	Ongoing	Spraying of Giant Hogweed carried out at 8 sites - featured on Central TV (Heart of the Country).
17.9 Recreate and maintain botanical status of Montgomery Canal in off-line nature reserves.	BWMWRT	EN/CCW	U	=====	=====	=====	=====	Ongoing	As a result of concerns from conservation bodies an ecological subgroup is reviewing the environmental resources currently in place for the canal restoration.

Note: As stated in last years Annual Review Action 17.6 - Promote Tir Cymen, Water Fringe Habitats Scheme, Countryside Stewardship and other appropriate schemes in riparian locations is part of our routine ongoing work that is carried out throughout the year and will not be reported on in the Annual Reviews.

Issue 18. Obstacles to Salmon Migration

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
18.3 Stock rivers above other obstacles with local hatchery reared juvenile salmon and/or transport adult salmon upstream.	Environment Agency		C40	<10	<10	<10	<10		36,000 salmon fry and 10,000 salmon smolts were stocked out during 1996 into rivers in the catchment.
18.4 Investigate viability of providing access for salmon to the River Severn upstream of Felindre Weir.	Environment Agency		U				==		No work planned for this reporting year.
18.5 Investigate alternative funding for improvement projects in light of diminishing Grant in Aid.	Environment Agency		U	==	==	==	==	Ongoing	No immediate options. The River Severn salmon management plan (due after 1997) will consider this point further.

Note: Actions :

- 18.1 - Construct salmon pass at Pontdolgoch Wier on Afon Gamo, and
 - 18.2 - Investigate possibility of providing access for spawning salmon to the upper reaches of the River Mule.
- have been completed.

Issue 19. Protection and Maintenance of Native Brown Trout Population

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
19.3 Determine and implement S30 Stocking Consent Policy for brown and rainbow trout in rivers.	Environment Agency		R	=====	=====	=====	=====	Ongoing	Draft policy completed. Consultation and implementation planned for 1997/98.
19.4 Protect isolated population of native brown trout in upper reaches of Afon Dulas.	Environment Agency		R	=====	=====	=====	=====	Ongoing	Routine/ongoing. No specific threats in 1996/97.
19.5 Assess present status of native brown trout populations in the catchment.	Environment Agency		R50	10	10	10	10		Surveys undertaken on Afon Rhiw, Afon Twrch, Rivers Tanat, Cain and Vymwy.
19.6 Determine measures to mitigate any declines in river brown trout populations.	Environment Agency		U	=====	=====	=====	=====	Ongoing	Habitat improvements carried out on River Tanat and Morda. Section 30 stocking policy (see 19.3) under development.

Note: As stated in last year's Annual Review, Actions 19.1- Safeguard habitats and 19.2 -Resolve acidification problems are to be addressed under Issue 1 and 2.

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
20.1 Maintain surveillance and anti poaching patrols by Water Bailiffs.	Environment Agency		R 125	25	25	25	25		Extensive patrols/surveillance undertaken October - December 1996 at vulnerable locations.
20.2 Maintain checks on illegal sales of salmon at major outlets.	Environment Agency		R10	<5	<5	<5	<5		Checks made at appropriate locations - no illegal activity detected..
20.3 Review Fisheries Bylaws to combat illegal salmon fishing in close season.	Environment Agency		U		=====				Draft bylaw change proposals to Regional Fisheries Advisory Committee 1997/98.

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
21.1 ▲ Assess the population trends and current distribution of cormorants and goosanders in the catchment.	RSPB		<5	<5					British Trust for Ornithology will be repeating the National goosander survey (1987) in 1997.
21.2 Monitor impacts of piscivorous birds on local fish stocks where appropriate.	Environment Agency	EN/CCW RSPB, Environment Agency	R	=====	=====	=====	=====	Ongoing	No specific reports of damage were received.
21.3 Ensure appropriate consultation on applications to control piscivorous birds.	MAFF WOAD		R	=====	=====	=====	=====	Ongoing	No applications were referred by MAFF/WOAD to The Agency.

Issue 22.

Prevention of Unauthorised and Other Environmentally Damaging River Works

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
22.1 Promote awareness in agricultural community of damaging environmental impacts of unauthorised river works.	Environment Agency		R	=====	=====	=====	=====	Ongoing	Presentation and draft publicity document given to FUW. New leaflet to be distributed 1997/98. Proactive visits to landowners undertaken by fisheries inspectors and Flood Defence Technical Liaison Officers.
22.2 Enforce Water Resources Act 1991 to prevent unauthorised river works.	Environment Agency		R	=====	=====	=====	=====	Ongoing	Unauthorised river works stopped at Llandinam.
22.3 Notification of Dolwen/Penstrowed geomorphological SSSI on River Severn.	CCW		U	=====					No progress by CCW.
22.4 Enforce Fisheries Legislation to protect salmon spawning gravels from unauthorised river works.	Environment Agency		R	=====	=====	=====	=====	Ongoing	Instream works on gravels in Afon Rhiw stopped at start of spawning season.
22.5 Δ Promote the use of 'soft' bio-engineering works for bankside protection.	Environment Agency		U	=====	=====	=====	=====	Ongoing	Repairs to willow revetment on River Tanat, Deflectors used by landowner at Caerhowell to combat erosion instead of hard revetments.

Issue 23. Water Level Management in the Severn-Vyrnwy Confluence Area

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
23.1 Develop long term environmental strategy for water level and land use management in the confluence area.	CoCo Environment Agency, IDB NFU/FUW CLA	Landowners Wildlife Trust EN/CCW	U	=====					Applications made for European Funds through Government office and MAFF. These are under consideration.
23.2 Develop and implement strategy for flood defence capital and maintenance works in the confluence area.	Environment Agency		C50 C65	25	=====	=====	=====	Ongoing	Flood defence Strategy completed in November 1996.
23.3 Merge environmental and flood defence strategies to form overall strategy.	Environment Agency		C<10	=====					Draft strategy produced. Currently being reviewed with statutory consultees. Publication due 1997/98.

Note 1 - £40k = actual spend.

Note: Action 23.4 - Identify sites of archaeological importance in the confluence area, was completed during 1995/1996.

Issue 24. Preservation and Definition of Flood Plain

ACTIONS		RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
		LEAD	OTHER							
24.3	Install more level and flow gauging stations.	Environment Agency		C7	U					None installed in 1996/97.
24.4	Carry out ground level surveys and computer modelling.	Environment Agency		C224	100	124				Floodplain mapping ongoing.
24.5	Update flooding survey for S105 Water Resources Act 1991.	Environment Agency		U	==	==	==	---		Updated Flooding survey issued in June 1997.

Issue 25. Caravan Sites in Flood Plain

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
25.1 Monitor inclusion of policies in Development Plans to prevent development of caravan sites in flood risk areas.	Environment Agency	LPA	R	=====	=====	=====	=====	Ongoing	In "Policy and Practice for the protection of floodplains", the Agency states that it is vital that the planning Authorities fully consult the Agency when considering planning proposals for holiday parks , caravan and camping sites..

Issue 26. Impact of Land Use Changes Including Hill Land Improvements and Afforestation, and Rates of Run-Off

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996/97	1997/98	1998/99	1999/2000	FUTURE	PROGRESS
	LEAD	OTHER							
26.1 Investigate scale of impact.	Environment Agency	LPAs	C						Data from Welsh Office awaited.

Issue 27. Impact of Development on the Water Environment

ACTIONS	RESPONSIBILITY		Total Cost (£k)	1996 / 97	1997/ 98	1998 / 99	1999/ 2000	FUTURE	PROGRESS
	LEAD	OTHER							
27.1 Liaise with LPAs and seek adoption of appropriate policies in Development Plans.	Environment Agency	LPAs Developers	R	====	=====	=====	=====	Ongoing	Routine/Ongoing
27.2 Increase EA involvement in pre-planning enquiries, development briefs and planning agreements.	Environment Agency	LPAs Developers	R	=====	=====	=====	=====	Ongoing	Routine/Ongoing
27.3 Include environmental enhancement as part of development where appropriate, and press for aftercare programmes .	Developers LPAs	Environment Agency DoT WO Riparian Owners	U	=====	=====	=====	=====	Ongoing	Routine/Ongoing
27.4 ▲ Encourage bridge designers to incorporate holes and ledges into new structures for enhancing bird and bat habitats.	Environment Agency DoT	LAs RSPB	U	=====	=====	=====	=====	Ongoing	Routine/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).	Powys CC LPAs Environment Agency	Montgomeryshire Wildlife Trusts	U	=====	=====	=====	=====	Ongoing	Ongoing. Powys CC seeking to identify suitable flood plain locations for gravel extraction via liaison with SAGA. Due to transportation cost gravel winning on a large scale appears unlikely.
27.6 ▲ Control and monitor economically viable and environmentally acceptable hydropower developments.	Environment Agency	LPAs Developers	R	=====	=====	=====	=====	Ongoing	No new applications received in the review year

Note: 27.1, 27.2, 27.3, - Progress on these routine, ongoing activities will not be reported in future reviews

New Issues:

Use of Pyrethroid Sheep Dips

Background

Concerns over risks to human health from the use of organophosphate sheep dips, coupled with the need to obtain a certificate of competence before being able to purchase these dips, has led to an increase in the use of synthetic pyrethroid sheep dips over the past two years. Although these compounds, notably flumethrin and cypermethrin are considered safer for humans, they are believed to be up to one hundred times more toxic to aquatic invertebrate life. In sheep farming areas, including the River Severn Upper Reaches catchment, there have been several incidents where long stretches of river have had virtually all invertebrate life wiped out and synthetic pyrethroids are suspected as being the cause.

Work is being undertaken in the main sheep farming areas of England and Wales to assess the impact of sheep dip chemicals on the water environment, in particular the use of synthetic pyrethroids. In this area selected catchments are being monitored for water quality, sediment quality and quality of invertebrate life in the watercourses. Farms are being visited to gather information on the location of dipping baths, the chemicals used and disposal methods for the excess solution.

On a national scale, publicity is planned to explain to farmers, the high pollution risks from these chemicals.

Use of Pyrethroid Sheep Dips

Option	Benefits	Constraints	Funding For Option
Do nothing.	None.	Agency not carrying out its duty,	Agency - none. External - none
Assess current situation. 3 phases; a) Identify catchments for investigation. b) Identify peak period of dipping. c) Identify monitoring requirements and capabilities.	Efficient targeting of resources. Knowledge of area activities.	Scarcity of manpower resources. Cost of sampling and analysis.	Agency < 5 External - none.

Reduction in discharge volume from Llanforda WTW

Background

Llanforda Water Treatment Works (WTW) operated by North West Water (NWW) provides full treatment to water abstracted from Vyrnwy Reservoir that supplies Liverpool with drinking water. The treatment system includes slow sand filtration through 23 filter beds. NWW are currently undertaking a programme of filter bed refurbishment to reduce water wastage from leakage through these beds. This leakage combines with other waste process water and is discharged to the River Morda, this discharge is controlled by the Environment Agency through a stringent conditional consent to discharge. It is anticipated that this programme will reduce the volume of discharge by at least half, from 8.5 megalitres per day (Mld) to 4.0 Mld.

The effect of this will be a significant reduction of available flow in the River Morda to dilute the effluent discharged by Oswestry Mile Oak sewage treatment works (STW). Mile Oak is operated by Severn Trent Water Ltd and discharges to the River Morda a short distance downstream of Llanforda Water Treatment Works. The likely result of this will be the failure of the River Morda to achieve its River Quality Objectives (RQO's) downstream of the STW discharge.

Asset Management Plan (AMP) 2 funds are currently allocated to provide sewage treatment at Mile Oak STW to improve effluent quality to ensure compliance with the EC Freshwater Fisheries Directive in the stretch. It is unlikely that these improvements will be sufficient to ensure continued compliance with RQOs when the anticipated reduction in flow has taken place.

Reduction in discharge volume from Llanforda Water Treatment Works (Oswestry)

Option	Benefits	Constraints	Funding For Options
Do Nothing.	None.	Failure to meet medium and long term objectives. Agency not carrying out duty.	Agency - None External - None
Assess effect of loss of dilution water on river quality downstream of Mile Oak. Determine future discharge consent requirements.	Provide sound basis to enable STW Ltd to assess treatment requirements and options. Identify investment needs.	Availability of Resources Additional expenditure for STW Ltd	Environment Agency < 5 STWL to be assessed.

5.0 FUTURE REVIEWS

It is important to monitor the Action Plan, to ensure that targets and actions are achieved and that the plan continues to address relevant and significant issues in the catchment in an appropriate manner. This report summarises the progress made since the publication of the First Annual Review in June 1996. The following annual review will cover the period July 1997 - June 1998, and will deal with the water environment only.

Work will commence in 1998 on the Local Environment Agency Plan (LEAP) for the catchment. The LEAP Consultation Report will be published in October 1998 and will consider the full spectrum of Agency responsibilities.

APPENDIX 1 Current status of the Local Authority Development Plans in the Catchment

Local Authority	Development Plan and Current Status
<p>Powys County Council</p> <p>-Radnorshire</p> <p>-Montgomeryshire</p> <p>For ex Clwyd/ Glyndwr Areas:</p>	<p>Powys County Structure Plan(Replacement)1991- 2006 -Adopted February 1996. Minerals Local Plan - Adopted March 1995.</p> <p>Radnorshire Local Plan, Consultation Draft July 1994.</p> <p>Montgomeryshire Local Plan (including waste policies) - Deposit draft October 1995. Public Inquiry September 1996. Proposed modifications June 1997.</p> <p>Clwyd County Council Structure Plan (1986 -2006). Amended Deposit Draft Jan 1996.</p> <p>Glyndwr District Local Plan - adopted 14 February 1994.</p>
<p>Shropshire County Council</p>	<p>Shropshire County Structure Plan 1989 - 2006 - operative from 1 January 1993. Review commenced - Consultation Draft due Spring 1997.</p> <p>Shropshire Minerals Local Plan - Deposit Draft April 1996. Public Inquiry June 1997.</p> <p>Shropshire Waste Local Plan - Consultation Draft in preparation</p>
<p>Oswestry Borough Council</p>	<p>Oswestry Rural Area Local Plan - adopted 1991.</p> <p>Oswestry Borough Local Plan (District Wide) - Deposit Draft May 1996. Public inquiry April 1997.</p>
<p>Shrewsbury & Atcham Borough Council</p>	<p>Shrewsbury & Atcham Rural Area Local Plan - adopted 9 June 1992.</p> <p>Shrewsbury Urban Area Local Plan - adopted 1985.</p> <p>Shrewsbury & Atcham Local Plan (District Wide) - Consultation Draft Feb 1995. Deposit stage due 1997.</p>
<p>South Shropshire District Council</p>	<p>South Shropshire Local Plan - Adopted October 1994. Review commenced. Public Construction Draft due 1997.</p>
<p>Wrexham County Borough</p>	<p>Clywd County Council Structure Plan (1986-2006) Amended Deposit Draft January 1996.</p> <p>Glyndwr District Local Plan-adopted 14 February 1994.</p> <p>Work commenced on unitary plan.</p>
<p>Ceredigion Council</p>	<p>Dyfed County Structure Plan - Alteration No.1 adopted October 1989.</p> <p>Ceredigion District local Plan Consultation Draft May 1995</p>
<p>Gwynedd Council</p>	<p>Gwynedd County Structure Plan (1991-2006) - adopted 29 October 1993.</p> <p>Eryri Local Plan - Consultation Draft October 1995 prepared by Snowdonia National Park</p>

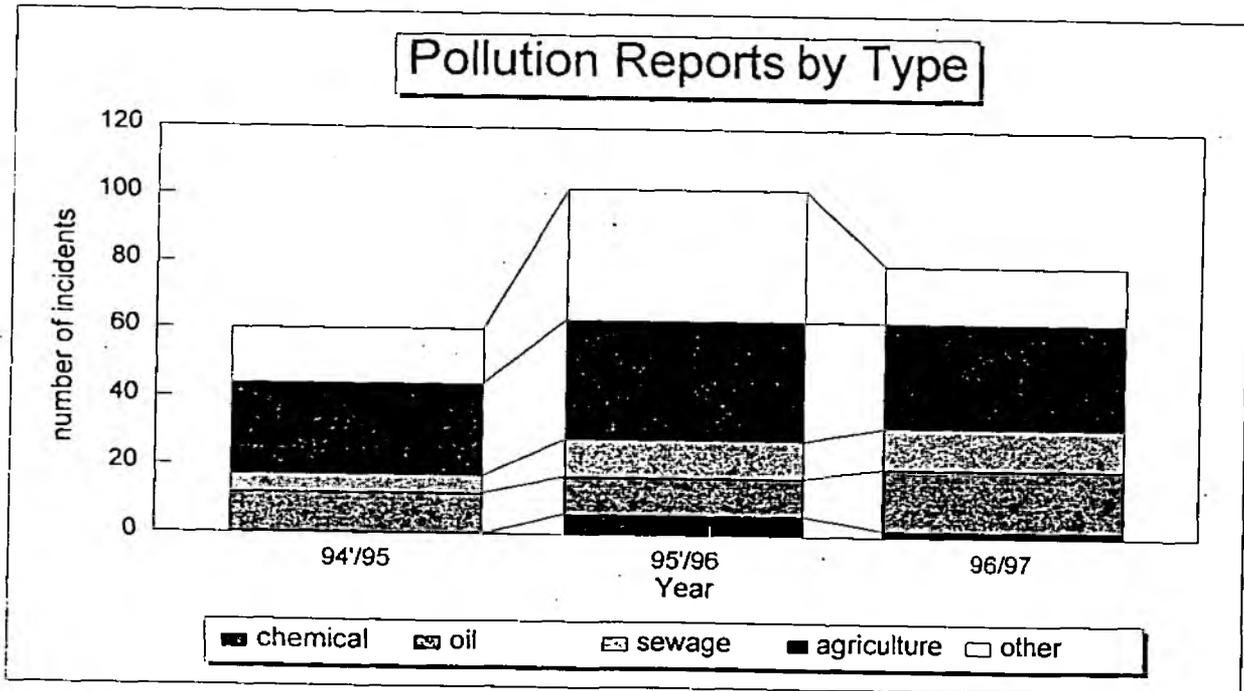
APPENDIX 2 Pollution Incidents April 1996 - March 1997.

The table below shows the pollution incidents for April 1996 to March 1997. The type and cause of the pollution is indicated, together with the severity, as denoted by the classification of the incident.

		Class 1	Class 2	Class 3	TOTAL
Cause	Industrial and commercial	0	0	8	8
	Water Utility Companies	0	0	10	10
	Agriculture	0	5	29	34
	Other	0	0	24	24
	Total	0	5	71	76
Type	Chemical	0	1	1	2
	Oil	0	0	18	18
	Sewage	0	0	12	12
	Agriculture	0	3	28	31
	Other	0	1	12	13
	Total	0	5	71	76

Class 1: major incident Class 2: significant incident Class 3: A minor incident

The histogram below shows the overall trend of reported incidents by type in the River Severn Upper Reaches Catchment April 1994 - march 1997.



APPENDIX 3 Fisheries Surveys and Fish Stockings

1. Fisheries Surveys

The following fisheries surveys were carried out in the catchment:

<u>Location</u>	<u>Sites</u>	<u>Purpose</u>	<u>Results and comments</u>
R Clun	3	Angling club complaint	Reasonable catches of trout. Advice given to club.
A Cain	6	Strategic survey programme	Some sites poorer than previously. Coarse fish numbers lower in downstream sites
A Vyrnwy	7	Strategic survey programme	Very low flows in some tributaries but fish numbers good. Salmon numbers poor at site with goosanders.
A Rhiew	5	Juvenile salmon survey	Some sites affected by low flows, Trout numbers poor at some sites. Salmon numbers good.
A Twrch	5	Acidification survey	Numbers of Salmon and trout continue to improve following liming.
A Tanat	5	Juvenile salmon survey	Results within previously recorded limits. No apparent problems.
A Tanat	3	Habitat improvement survey	Improved fish populations following habitat improvement works
R Severn (Shrawardine)	1	Angling club advisory	Satisfactory fish population observed
R Severn	5	Acidification survey	Upstream sites still fishless. Downstream sites reasonable with good recruitment of trout.
A Banwy	8	Strategic survey programme	Trout numbers poor at some sites. May be linked to sheep dip problems.

2. Salmon Stocking

The following salmon stocking was carried out in the catchment:

River	Reach	Salmon stocked	
		Life stage	Number
Tanat	Tributaries and Main River	O + Parr	23,400
Severn	Tributaries upstream of Welshpool	O + Parr	26,300
Tanat	Tributaries and Main River	1 + Parr	9,875