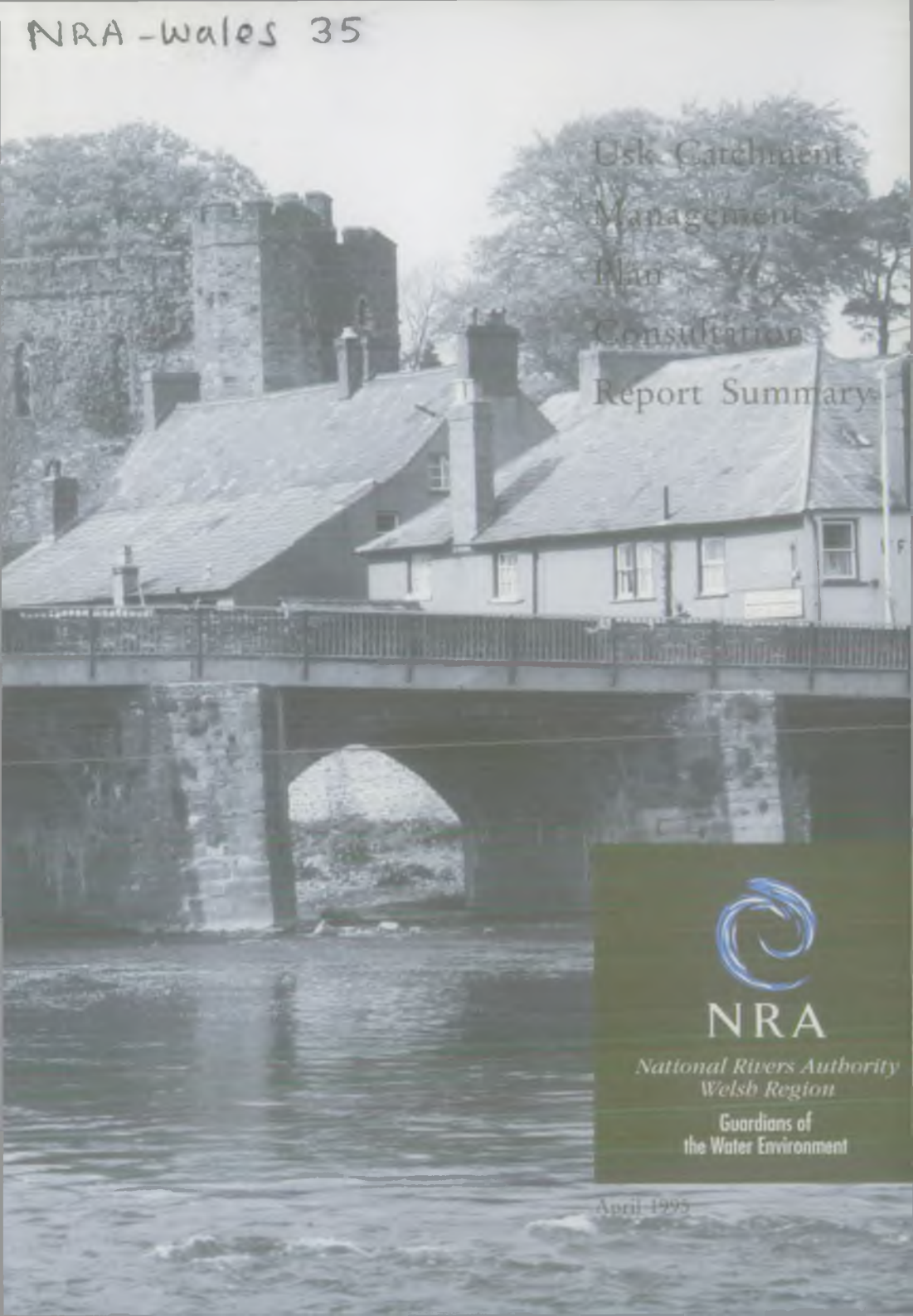
Usk Catchment Management Plan Consultation Report Summary



NRA

National Rivers Authority
Welsh Region

Guardians of
the Water Environment

April 1995

COVER PHOTO: *River Usk at Brecon (Courtesy of Wales Tourist Board)*

THE NRA'S VISION FOR THE USK CATCHMENT

The Usk catchment is one of extraordinary contrasts: the mountainous landscape of the Brecon Beacons to the lowland plains and estuarine area around Newport; the rural character of much of the River Usk valley to the highly populated and industrialised Afon Lwyd Valley; the man-made channel of the Monmouthshire and Brecon Canal to the fast flowing headwaters of the River Usk and the daily changes witnessed by an estuary experiencing the second highest tidal range in the world.

These many and varied features allow the catchment to support a variety of uses such as farming, forestry, water supply, industry and tourism. The rivers and canal provide many opportunities for recreation, including canoeing and angling, walking and bird-watching. The catchment offers a habitat for many rare plants and animals, including otters, little ringed plovers, twaite shad, sea and river lamprey, invertebrates and lichens.

The National Rivers Authority's task is to seek to balance these uses now and in the future. Our main aim is to achieve a sustainable use of the catchment and our key objectives are:

- To maintain and improve the conservation value of the catchment.
- To improve the River Usk's spring salmon and wild brown trout fishery with runs and catches of salmon meeting targets consistent with ideal breeding levels. To sustain healthy coarse fish, eel and the important shad populations.
- To ensure that all those who wish to use the catchment for recreational purposes can enjoy doing so with the mutual respect and consideration of others.
- To maintain and improve, where possible, flood defences in order to protect people and property.
- To control the spread of alien plants within the catchment.
- To maintain the importance of the Usk catchment as a major supplier of water throughout South Wales and to diminish the effect of these abstractions upon the water environment.
- To ensure that by utilising the natural capacity of the river to dispose of treated effluents it does not result in a loss of the river's ecological and fishery potential.
- To seek continued improvements in the water quality of the Usk and its tributaries wherever possible, in particular by encouraging the improvement of combined sewer overflows and encouraging the Government to produce a strategy for the control of minewater from abandoned mines.

- To ensure that any development proposals in the catchment have no detrimental effect on surface water or groundwater resources in either quality or quantity nor on any associated flora and fauna. Close liaison with developers and contractors is essential particularly in the Afon Lwyd catchment.

The Usk catchment is subject to a proposal to construct a barrage across the estuary at Newport. This would significantly alter the existing tidal regime of the estuary, threatening the river's ecologyin general and each species of migratory fish in particular.

The views of local people and their representatives will be respected. We will need the help of the local communities and hope to build upon existing relationships and develop new ones in pursuing these goals. Through close liaison, regular reporting on our progress and our determination to fulfill our role we intend to maintain the impetus for action in the Usk catchment.

INTRODUCTION

Never before has there been such a pressing need to conserve our rivers, lakes and coastal waters to support the rapidly increasing recreational, domestic, agricultural and industrial demands placed upon them. On the other hand, the need to protect life and property from flooding has never been greater. The NRA has a wide range of responsibilities for the control of the water environment, and seeks to reconcile the conflicts raised by the competing needs for water. In particular, the NRA is responsible for:

- conservation of water resources
- pollution control
- flood defence and flood warning
- maintenance and improvement of fisheries

Llangynidr Bridge

- conservation of water related habitats
- promotion of water based recreation
- control of navigation in some areas.

The NRA believes that it can only carry out its work by adopting the concept of integrated catchment management. This means that a river catchment is considered as a whole and the actions in each of the NRA areas of responsibility must take account of the possible impact on other areas.

The NRA has decided to formally present its catchment management policies to the public via Catchment Management Plans which will be produced for all the rivers in Wales by 1998. The Plans are intended to provide a link between the NRA and the users of water in each catchment so that the Authority can better reflect their interests whilst carrying out its duties. For this reason each Plan includes a Consultation Phase during which the general public are invited to comment on the NRA's proposals for the future management of the catchment.

YOUR VIEWS

The Usk Catchment Management Consultation Report is our assessment of the state of the catchment and identifies the key issues which need to be resolved. The most important are outlined in the tables at the end of this summary report. We need your views:

- what do you think about the Plan in general?
- have we identified all the uses?
- have we identified all the issues?
- what do you think about the options proposed?
- do you have any other information about the catchment or any comments about its future management?

If you would like to comment on the Consultation Report or receive a copy of the full document, please write to:

THE AREA CATCHMENT PLANNER
NATIONAL RIVERS AUTHORITY
SOUTH EAST AREA - WELSH REGION
PLAS-YR-AVON
ST MELLONS BUSINESS PARK, ST MELLONS
CARDIFF CF3 OLT

TELEPHONE: 01222 770088

THE USK CATCHMENT

This plan covers the main River Usk, the Afon Lwyd and the Monmouthshire and Brecon Canal. The River Ebbw and the coastal levels area will be dealt with in separate catchment management plans.

The River Usk rises on the northern slopes of the Black Mountain of Dyfed and flows through the rugged landscape of the highest mountains in South Wales. Its headwaters and those of its tributaries are contained within the Usk, Cray, Talybont and Grwyne Fawr reservoirs. At Brecon, the Monmouthshire and Brecon Canal begins its parallel path alongside the river until the floodplain widens at Abergavenny where the Usk takes a separate course, via the town of Usk, to join the Severn Estuary at Newport. Meanwhile, the canal heads towards Pontypool where it crosses the Afon Lwyd and then fragments into sections. The Afon Lwyd rises above Blaenavon and passes through the highly populated and industrialised areas of Pontypool and Cwmbran before joining the Usk estuary near Caerleon.

MAP OF THE USK CATCHMENT AREA

CATCHMENT STATISTICS

Catchment Area:	1358 km²	
Highest Point:	886m (Pen y Fan, Brecon Beacons)	
Annual Average Rainfall:	1340 mm	
River Length:	Usk - 137km	Llwyd - 31km
Average Daily Flows:	Usk - 2750 Ml/d	Llwyd - 270 Ml/d
Gross Licensed Abstraction:		2103 Ml/d
Total Water loss not returned to catchment:		29 Ml/d

(1 Megalitre is a million litres)

Populations in the Usk Catchment:

County Council	*Borough Council*	*1991*	*2021 (predicted)*
Gwent	Blaenau-Gwent	3732	3809
Gwent	Monmouth	29293	36143
Gwent	Newport	95920	98234
Gwent	Torfaen	88812	95396
Powys	Brecknock	18689	21010
Total Population in the Usk Catchment		236445	254592

Fisheries:

Average annual declared Salmon Rod Catch (1982-1993)	560
Average Annual Fish Count at Trostrey Weir (1988-1994)	4604
Target salmon run size for optimal egg deposition	6500
Equivalent target declared salmon rod catch	1500
No. of salmon anglers (approx.)	1000
No. of trout anglers (approx.)	7000
No. of coarse anglers (approx.)	3000

Fish Species Present in the River:

Salmon, Seatrout, Trout, Sea Lamprey, Brook Lamprey, Allis Shad, Twaite Shad, Chub, Dace, Eel, Roach, Stickleback, Stoneloach, Bullhead, Perch, Minnow, Gudgeon, Barbel, Carp, Tench, Pike and River lamprey.

Water-Associated Activities:

Walking, angling, nature watching, birdwatching, canoeing, rowing, boating, windsurfing, sailing, caving.

Flood Defence:

Length of Statutory Main River: 252km

Newport Tidal Range:

Mean high water - spring 6.3m AOD	Mean high water - neap 3.2m AOD
Mean low water - spring-5.6m AOD	Mean low water - neap -2.9m AOD
Highest high water - spring 7.6m AOD	Lowest low water - spring -6.5m AOD

DEVELOPMENTS AND LAND USE

The catchment is largely rural and sparsely populated, the exceptions being the towns of Newport, Abergavenny, Pontypool, Cwmbran and Brecon. Agriculture is the predominant land use in the catchment with industry concentrated in the lower urbanised catchment and along the Afon Lwyd. Tourism has always been important to the local economy with the historic towns of Usk, Brecon, Abergavenny, Crickhowell, Caerleon and Raglan and other sites such as the Brecon Beacons and Big Pit Mining Museum in Blaenavon within the catchment.

Usk at Abergavenny

Development in the northern area of the catchment is centred around the main towns of Sennybridge, Brecon and Crickhowell. The southern area is far more urbanised. The local plans have allocated land for housing and industrial development throughout the catchment. The Gwent County Structure Plan indicates that significant land development will be located in Pontypool, Blaenavon, Brynmawr, Cwmbran and the Docks area of Newport .

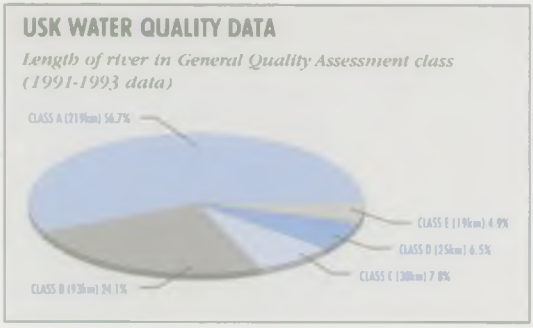
The development of the docks area is dependent upon the outcome of the public inquiry into the construction of a Barrage across the estuary at Newport. This proposal, by Newport Borough Council and Gwent County Council, is resolutely objected to by the NRA mainly for fisheries reasons.

Road schemes currently underway are the M4/A4042 Brynglas Tunnels and Malpas Road relief scheme, and the A4042 Llantarnam Bypass with a major dualling scheme proposed for the A465 Abergavenny to Hirwaun road west of the A4042. A major new bridge, crossing the Usk at Newport is also envisaged as part of the proposed M4 Relief Road.

WATER QUALITY

Water quality in the Usk catchment is generally very good. The main river upstream of the tidal limit, and the majority of the tributaries are of high enough quality for potable abstraction and for salmonid fisheries. Due to the

urban and industrialised nature of the Afon Lwyd sub-catchment, this river suffers from minewater and intermittent polluting discharges of sewage. The oxygen content of the Monmouthshire and Brecon Canal varies significantly during the year due to a combination of of sluggish flows and heavy weed and algal growths.

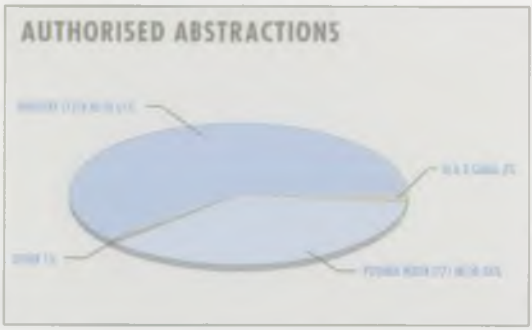


The Usk has a highly dynamic estuary which gives rise to extensive re-suspension of mud and a brown colouration. Under certain conditions sudden reductions in dissolved oxygen content occur due the oxygen demand of the resuspended mud and are exacerbated by discharges of crude sewage.

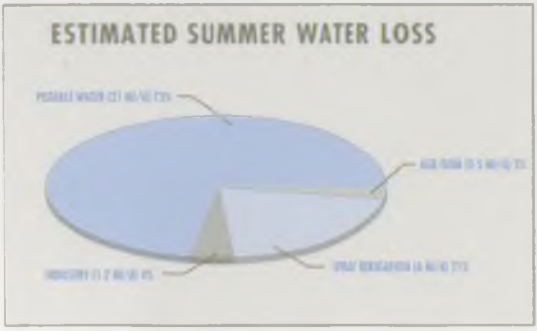
WATER RESOURCES

The Usk catchment has a mild and wet climate, with heavy rainfall on the mountainous upper catchment. Less than half of this rain evaporates or is used by plants, leaving it to promote generally high river flows. Over most of the catchment, however, the groundwater contributions to this flow are modest so the river falls quite rapidly in dry periods. The typical dry summer flow of the Usk is reduced to 360 Megalitres per day (Ml/d), only an eighth of the average flow. Where carboniferous limestone outcrops in the Llwyd and Clydach valleys, there are many more springs and consequently river levels are better maintained than elsewhere.

The pattern of flows allows the catchment's water to be utilised as a major resource. The Usk is an essential link in a network of water supply serving the whole of the South East Wales. There are five major reservoirs (Talybont, Llandegfedd, Cray, Usk and Grwyne Fawr), three large abstractions from the river Usk at Rhadyr, Llantrisant and Brecon and a number of smaller local abstractions. These all help provide water to the Usk catchment, Cardiff and the Swansea and Ebbw valleys.



As well as this, the Usk water is also taken to supply a



variety of other uses, including industry and the Monmouthshire and Brecon canal. The pie chart describes the water taken by the different users within the catchment.

The pattern of water loss is somewhat different to the water use (see pie chart). Most of the public supply water is not a 'loss' as it is taken from reservoirs of stored water, and the reservoirs also support the large abstractions at Rhadyr and Llantrisant during periods of low flow. Similarly, much of the industrial water abstracted is taken by Uskmouth Power station from tidal water and therefore has no affect on the river system. The canal abstraction does not cause a 'loss' to the catchment but does substantially affect the River Usk.

FLOOD DEFENCE

The River Usk flows through low-lying agricultural land along much of its length from Brecon to the tidal limit at Newbridge-on-Usk. In the uplands, much of the rainfall runs rapidly off the Old Red Sandstone rocks, the waterlogged peat and thin soil cover. The catchment is long and narrow, with the Usk running through its centre and the tributaries typically short. During periods of heavy rainfall within the catchment, the flood plain becomes inundated and the total width of the river and floodplain can exceed 1.5km in places.

Tidal Flooding in lower Usk catchment

Downstream of the tidal limit, flooding largely results from tidal influences. This is due to the Severn Estuary tidal range which is the second highest in the world. At Newport, the predicted tidal range is approximately 14.1metres.

Many of the demands placed upon the amount of water in the river - whether recreational, domestic, agricultural or industrial - are rapidly increasing and the need to protect life and property from flooding has never been greater.

Widespread development has taken place within the flood plain of the river at several locations such as Brecon, Crickhowell, Usk and Ponthir. Major flood alleviation schemes have been carried out to protect these settlements from inundation by water. At Newport and Caerleon works have been carried out to protect against tidal flooding. Other reaches benefit from privately financed defences.

A Water Level Management Plan may be produced for the Gwent Levels which will include parts of the Usk catchment. Sites requiring these documents, which aim to provide a means by which water levels for a range of activities can be balanced, will be agreed with the Countryside Council for Wales by early 1995. There will be a 3 year prioritised programme for the production of these plans.

FISHERIES

The catchment's rural character and good water quality generally supports a good flora and fauna. The Usk is one of the principal salmon rivers in Wales and is historically famous for its spring salmon run. It is also probably the most renowned wild brown trout river in Wales, and coarse fish species, particularly chub and dace, are present in the middle and lower reaches. It is one of the few British rivers where shad are found. The twaite shad flourish in the Usk whilst the very rare allis shad is occasionally seen. The salmon and trout fisheries are very important to the local economy as they attract angling tourists from afar.

Lionel Sweet and catch of Usk Spring Salmon (1933)

The proposed Usk Barrage in Newport is potentially a very serious threat to migratory fish populations including salmon, sea trout, eel, sea lamprey and shad. This is the reason why the NRA opposes this scheme.

CONSERVATION/ECOLOGY

The Usk and the majority of its tributaries are typical, upland gravel-bed rivers providing a range of aquatic and marginal habitats. Many of the watercourses ,particularly in the upper catchment, are tree and shrub-lined. It also supports a relatively rich flora, nationally rare lichen species associated with emergent and flood-zone boulders, and some rare bryophytes, associated with boulders and riparian trees.

Kingfisher

The catchment supports all the common riverine birds and eroding cliffs and shoals in the middle reaches provide important nesting sites for sandmartins, common sandpipers and little ringed plovers. Goosanders also breed in the area.The otter population has recently expanded from its stronghold in the upper half of the river and the majority of the catchment, including the lower reaches of the Afon Lwyd, is now used by them. Water voles (currently under threat in the U.K.) are restricted to a small population on the Monmouthshire and Brecon Canal but mink are widespread. The catchment also supports excellent populations of bats including the rare Lesser and Greater Horseshoe bats. The invasive alien plants, Japanese Knotweed, Himalayan Balsam and Giant Hogweed are present in the catchment with Giant Hogweed being a significant problem in the lower catchment. The river supports many rare invertebrates.

The River Usk

There are 31 designated Sites of Special Scientific Interest (SSSIs) in the catchment that have some wetland component. These include small ponds, streams and wet grasslands as well as parts of extensive moorlands such as the Brecon Beacons and the Black Mountain. Llandegfedd and Talybont reservoirs are both primarily notified for their overwintering wildfowl. The Usk discharges into the Severn Estuary SSSI and proposed Special Protection Area and Ramsar Site. Although the River Usk itself is of nature conservation interest, only one short length is actually within a SSSI, partly for geomorphological reasons.

There are 17 County Trust Nature Reserves and a large part of the catchment lies within the Brecon Beacons National Park. A number of sites and structures linked with the start of the industrial revolution and exploitation of the South Wales coalfields (particularly in the Blaenavon/ Clydach Gorge area) have been proposed as World Heritage sites. These include features closely associated with watercourses in the Usk catchment such as Clydach Ironworks and the Monmouthshire and Brecon Canal.

A considerable part of the lower catchment, including the main Usk valley between Abergavenny and Caerleon, is a Special Landscape Area in the Gwent County Structure Plan. A small pocket at the extreme eastern edge of the Olway catchment extends into the Wye Valley Area of Outstanding Natural Beauty.

Parts of Brecon, Crickhowell, Abergavenny, Usk and Caerleon are Conservation Areas and Tredunnock to Newbridge on-Usk is a proposed Conservation Area. In addition to scheduled historic sites there are a significant number of unprotected sites which may be as valuable yet are more vulnerable.

RECREATION

The scenic Usk Valley attracts many visitors and residents who spend their leisure time close to the river, its tributaries and canal. Walkers, anglers and naturalists all use and enjoy the river corridor. Paddle and row boats are available for hire above Brecon weir and at Cwmbran

Canoeing on the Monmouthshire and Brecon Canal

boating lake and there is a boating club at St.Julians in Caerleon. At Llandegfedd reservoir a wide variety of watersports take place including sailing, windsurfing, scuba diving and canoeing. Canoeists use the river with the permission of riparian owners.

Newport Harbour Commissioners are the Navigation Authority up to Caerleon but the public right of navigation on the river extends up to the tidal limit at Newbridge-on-Usk. Pleasure craft currently use the Monmouthshire and Brecon canal between Brecon and Pontypool under the jurisdiction of British Waterways. Conflicts can occasionally arise where a user is ignorant or disrespectful of the requirements of other users.

ISSUES AND OPTIONS

The following tables list the 32 issues which the NRA has identified within the Usk catchment. We would like to hear from you if:

- you think there are other issues which we have missed
- you think that we have not considered all the options
- you have any views on the options suggested
- you have any other information about the catchment or comments about its future management.

ABBREVIATIONS USED IN TABLES

AMP2	Asset Management Plan
BCU	British Canoe Union
CCW	Countryside Council for Wales
CSO	Combined Sewer Overflow
DCWW	Dwr Cymru/Welsh Water
FUW	Farmers Union of Wales
LA	Local Authority
NFU	National Farmers Union
NRA	National Rivers Authority
OPW	Otter Project Wales
SSSI	Site of Special Scientific Interest
STW	Sewage Treatment Works
UUFA	United Usk Fishermens Assoc.
WCA	Welsh Canoeing Association

Issue No.1:	WATER QUALITY TARGET FAILURE IN THE MONMOUTHSHIRE AND BRECON CANAL BETWEEN GOYTRE AND PONTYPOOL		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Increase monitoring to more accurately determine extent of water quality failure.	NRA	Quantify extent of water quality failure.	Costs to NRA

Issue No.2:	WATER QUALITY FAILURE IN THE AFON LWYD		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Undertake investigation into cause and extent of Biochemical Oxygen Demand failure, particularly CSOs.	NRA	Identifies sources.	Costs to NRA.
2. Assign appropriate priority for remedial action in the Regional CSO Strategy and undertake remedial action.	NRA/DCWW	Improvement to water environment.	

Issue No.3:	POOR WATER QUALITY IN MINOR TRIBUTARIES DUE TO AGRICULTURAL ACTIVITIES: NANT-Y-WILCAE, WECHA BROOK, BRYNICH BROOK TRIBUTARIES, LLANGYBI TRIBUTARY, DOWLAIS BROOK.		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Target catchment control work in these catchments.	NRA	Identification of sources of problem.	Costs to NRA
2. Identify farms for improved farm waste handling to comply with the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991.	NRA, Farmers.	Improvements to water quality in long term.	Unknown costs to farmers. Costs to NRA. Short term improvements unlikely to be achieved.

Issue No.4:	POOR WATER QUALITY IN SOR TRIBUTARY BELOW LLANHENNOCK CHESHIRE HOME SEWAGE TREATMENT WORKS		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Improvements to Llanhennock Cheshire Home STW.	Cheshire Home	Improvement to water quality of Sor Brook tributary	Costs to Cheshire Home.
2. Removal of discharge from watercourse to soakaway.	Cheshire Home	Improvement to water quality of Sor Brook tributary	Costs to Cheshire Home. Practicality of establishing a soakaway.

Issue No.5:	POOR WATER QUALITY IN PONTYRHYDON BROOK BELOW RAGLAN SERVICES STW		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Continued operational improvements to Raglan Services STW.	Granada Services	Improvement to water quality in Pontyrhydon Brook.	Costs to Granada services.
2. Re-assess quality conditions of consent to discharge.	NRA	Confirm environmentally protective consent.	Improvement to water quality not met without option 1.

Issue No.6:	POOR BIOLOGICAL QUALITY OF CLYDACH IN UPPER AND LOWER STRETCHES		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Improvements to CSO at Brynmawr roundabout.	DCWW	Improve biological quality in upper reaches of Clydach.	Costs to DCWW. Impact on CSO improvements planned elsewhere within the AMP2 capital investment programme.
2. Investigate lower stretches for sewage inputs.	NRA	Identify inputs. Enable targeting for remedial work.	Costs to NRA
3. Increase number of water quality monitoring points in lower stretches to identify causes of poor water quality.	NRA	Quantify extent of poor water quality.	Costs to NRA. May not identify water quality problems.
4. Undertake more detailed biological survey in lower stretches.	NRA	Quantify extent of poor biological quality.	
5. Re-assess quality conditions of Brynmawr STW consent and its impact on the Clydach.	NRA/DCWW	Confirm effectiveness of existing consent to protect water quality objective of Clydach.	Costs to NRA. Possible cost to DCWW. Impact on AMP2 capital investment programme.

Issue No.7:	POOR BIOLOGICAL QUALITY IN THE AFON LWYD CATCHMENT DUE TO DISCHARGES FROM ABANDONED MINES		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Investigate the possibility of treatment of these discharges.	NRA/Welsh Office	Identifies treatment options.	Costs to NRA
2. Seek changes in legislation to ensure effective control of existing and future abandoned minewater discharges.	NRA/Government	Provides effective control of discharges and improves water environment.	Costs to relevant authorities.

Issue No.8:	REMOVAL OF ANIMAL CARCASSES FROM WATERCOURSES AND RIVER BANKS		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Liaise with relevant bodies to confirm responsibility.	NRA, District & Borough Councils. NFU/FUW, Police Authorities	Carcasses removed.	Costs to relevant authorities.
2. Place onus on farming community for proper disposal of carcasses.	Farmers	Disposal costs referred to source of problem.	Regulation by relevant Authority still needed. Costs to regulating authority.

Issue No.9:	CONTAMINATION OF GROUNDWATER WITH SOLVENTS AND ASSOCIATED CONTAMINATED SEEPAGES FROM EMBANKMENT BELOW ANACOMP MAGNETICS, BRYNMAWR.		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Continued investigations into extent of contamination of groundwater.	Anacomp Magnetics	Identification of extent of problem.	Costs to Anacomp. Does not remove existing contamination.
2. Continued monitoring of embankment seepages.	NRA/Anacomp Magnetics	Identification of any impact on surface water quality	Costs to NRA. Does not remove existing contamination.
3. Relocation of underground solvent storage tanks to above ground.	Anacomp Magnetics	Enable Anacomp to more closely control solvent handling. Prevent further contamination.	Costs to Anacomp. Health and Safety implications to Anacomp. Does not remove existing contamination.
4. Consider options for removing contamination.	Anacomp Magnetics.	Improvement in ground water quality. Improvement to appearance and odour effects on embankment above Clydach. Remove risk of contamination of Clydach.	Costs to Anacomp.

Issue No.10:	THE IMPACT OF UNTREATED SEWAGE DISCHARGES TO USK ESTUARY		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Treat discharges individually.	DCWW	Spreads load of sewage on estuary. Improves water quality.	Higher costs to DCWW than 2).
2. Convey all discharges to one sewage treatment works (Nash).	DCWW	Minimises costs to DCWW. Improves water environment.	Concentrates all effluent discharge in one place in estuary.

Issue No.11:	IMPACT OF DŴR CYMRU - WELSH WATER ABSTRACTIONS AT RHADYR AND LLANTRISANT		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Agree amendments to the abstraction to consider the pattern of flow.	NRA/DCWW	Improved fish migration from and survival through estuary. Reduced visual effect on river. Improved ecological health of river below Rhadyr. Increased dilution of effluents.	Reduced benefit if Usk Barrage built. Potential reduction in yield of resource system. Costs to DCWW.
2. Reduce abstraction of small floods during spring and summer.	NRA/DCWW	Attract salmon into river for rod fisheries and access to spawning grounds.	Complexity. Potential reduction in yield of resource system.
3. Compensate for summer spates with reservoir releases.	NRA/DCWW	Increases stimulus to fish movement.	Reduced stored water. Less 'natural'. Unable to release sufficient water from Usk reservoir. Reduction in yield of resource system.

Issue No.12:	IMPACT ON RIVER OF WATER SUPPLY TO CANAL AT BRECON WEIR		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Install flow meter at the canal intake.	NRA/British Waterways	Increases knowledge of canal water use and Usk water balance. Assimilate with other options.	Costs. Does not allow control over flows.
2. Agree abstraction policy for Monmouthshire & Brecon Canal.	NRA/British Waterways	Improve migration of salmon and trout. Reduces waste of water. Improve ecological health of river below weir.	Could exacerbate low dissolved oxygen levels in canal.
3. Install automatic sluice at canal intake.	NRA/British Waterways	Reduce unnecessary diversion of water, increases flows over Brecon Weir for fish.	Costs. Could exacerbate low dissolved oxygen levels in canal.
4. Improve fish passage by upgrading one of the 2 fish passes.	NRA	Fish passage improved. Angling in pool not restricted.	Does not reduce water waste. Will only be effective with sufficient water. Costs.
5. Propose byelaw or rule to ban fishing from the weir.	NRA/Angling Club	Illegal exploitation reduced.	Reduction in angling facitlity.
6. Propose byelaw to ban fishing in weir pool.	NRA	Legal and illegal exploitation of salmon reduced.	Reduction in angling facility.
7. Augment flows with releases from reservoirs.	NRA/DCWW	Increase flow over weir.	It may not be possible as it reduces reservoir yield. Would not prevent water waste. No requirement on DCWW to do this.
8. Identify if river drainage into the canal affects small water courses.	NRA/British Waterways	Improves knowledge of catchment. May identify whether there are any local artificial reductions in flow.	Costs. Would not solve problems, only identify them.
9. Install flow measurement station in upper Usk.	NRA	Would assist in operating weir abstraction policy.	Costs. Difficult to maintain due to sediment load.

Issue No.13:	INSUFFICIENT INFORMATION ON GROUNDWATER LEVELS TO FULLY PROTECT WATER RESOURCES AND THE ENVIRONMENT		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Increase monitoring of groundwater levels within the aquifers of the catchments between 1996 and 1998.	NRA	Protect local aquifers and associated surface waters from over abstraction. Gain better understanding of catchment water resources.	Cost £50k.

Issue No.14:	AREAS SUBJECT TO TIDAL AND FLUVIAL FLOODING		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Monitor flooding to identify need for new defences.	NRA/Local Authorities	Improves knowledge.	Does not prevent flooding.
2. Review options for flood defence improvements to standards of service.	NRA/Local Authorities	May lead to development of new schemes.	Costs.
3. Promote flood defence schemes as appropriate to protect people and property.	NRA/Local Authorities	Standards of Service improved.	Costs. Possible effect on conservation interest.

Issue No.15:	FLOODPLAIN AND RIVERSIDE DEVELOPMENT		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Restrict development on floodplain and riverside via planning consultation procedure.	NRA/Local Planning Authorities	Management of flood risk to people and property. Reduction in need for future flood protection. Protects conservation interests.	Restricts development.
2. Production of Section 105 flood risk maps.	NRA/Local Planning Authorities	Fulfils statutory duty. Allows LPAs to make better informed decisions.	Cost £50k.
3. Use of statutory powers.	NRA	Better control of flood risk.	Statutory powers limited to 7 metres from river bank.

Issue No. 16:	LOSS OF WETLAND HABITATS IN CATCHMENT		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Promote improvement and creation of habitats via consenting procedures and planning responses.	NRA/LA's	Can include future management needs.	Not always in priority areas.
2. Determine the distribution of wetland habitats in the catchment.	NRA/CCW/ Conservation Organisations	Identifies priority.	Does not promote new habitats.
3. Provide at least 20 ha of damp grassland in the lower catchment.	NRA/Landowners/ Conservation Organisations	Conservation benefit to breeding waders.	Landowners may not agree. Costs.
4. Create or improve wetland habitats in the upper catchment.	NRA/Landowners/ Conservation Organisations	Conservation benefits to plants, insects, amphibians and birds.	Landowners may not agree. Costs.
5. Investigate the need for and feasibility of restoring upland bog habitat	NRA/Landowners/ Conservation Organisations/ Brecon Beacons National Park	Conservation benefits to plants, invertebrates and birds.	Landowners may not agree. Costs.

Issue No. 17:	LACK OF NATURAL REGENERATION OF RIPARIAN TREES AND SHRUBS IN SOME AREAS		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Protect and further the conservation of riparian vegetation during Flood Defence operations.	NRA	Can be incorporated into routine work over a period of time.	Landowners may not agree. Flood damage to works unless sites carefully selected. Not always in priority areas.
2. Promote the creation of riparian buffer zone in consenting procedures and via planning responses.	NRA/Local Authorities/ Landowners	Conservation, landscape and engineering benefits.	Work not always in priority areas. Future maintenance.
3. Assess the need for fencing, coppicing, pollarding and planting and identify suitable locations.	NRA/ Conservation Organisations	Helps address priority areas.	
4. Undertake a programme of fencing/planting, coppicing and pollarding to encourage regeneration of trees and shrubs.	NRA/Landowners	Conservation, landscape and engineering benefits.	Costs. Landowners may not agree. Future maintenance.
5. Undertake the planting of individual or groups of trees in the Usk floodplain for long-term conservation and landscape benefits.	NRA/Landowners	Conservation and landscape benefits.	Costs. Landowners may not agree. Future maintenance.

Issue No.18:	CONTROL OF ALIEN WEEDS, PARTICULARLY GIANT HOGWEED		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Determine the more detailed distribution of alien plants in the catchment in order to assess costs of control.	NRA/LA's	Identify scale of problem and priorities	Delay in implementation of control measures.
2. Produce a catchment strategy for the control of alien plants.	NRA/LA's/Land-owners/Fishing interests	Integrated approach.	Costs.
3. Undertake a control programme.	NRA/LA's/Land-owners/Fishing interests	Conservation and amenities benefit	Potentially high costs and long term commitment.

Issue No. 19:	LACK OF CONSERVATION STRATEGIES FOR RIVERINE ANIMALS		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Identify species requiring conservation strategies and draw up appropriate strategies.	NRA/CCW/Cons. Organisations	Identify needs and priorities.	Costs.
2. Co-operate with Otter Project Wales and others in the production of a Priority Catchment Management Plan for otters.	OPW/NRA/CCW/ Cons. Organisations	Identify needs and priorities	Costs.
3. Implement otter habitat enhancement measures where appropriate.	NRA/OPW/Cons. Organisations/ Landowners	Benefit to otter conservation.	Landowners may not agree.

Issue No.20:	NO STANDARDS OF SERVICE AGREED WITH CCW FOR NRA OPERATIONS AFFECTING SITES OF SPECIAL SCIENTIFIC INTEREST		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Agree standards of service.	CCW/ NRA	Protect SSSI. Ensures consistent approach.	Costs.

Issue No.21:	BARRIER TO FISH MIGRATION - CRICKHOWELL BRIDGE		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Improve fish passage with simple fish pass in bridge weir.	NRA/Highways Authority	Fish passage past bridge improved. Angling not restricted.	Costs.
2. No further dredging of pool to be consented - to be scoured naturally.	NRA/ Angling Clubs	Fish passage past bridge improved. Angling not restricted.	Possible reduction in angling facility.
3. Propose byelaw to ban fishing in weir pool.	NRA	Exploitation of salmon reduced.	Reduction in angling facilities at this location.

Issue No.22:	BARRIER TO FISH MIGRATION - LLANFOIST BRIDGE		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Improve fish passage with simple fish pass in bridge invert.	NRA/Highways Authority	Fish passage past bridge improved. Angling not restricted.	Costs.
2. Propose byelaw to ban fishing in weir pool.	NRA	Exploitation of salmon reduced.	Reduction in angling facilities at this location.

Issue No.23:	BARRIER TO FISH MIGRATION - PONTHENHAFOD GAUGING STATION		
OPTIONS	Responsibility	Advantages	Disadvantages
Replace crump weir with flat vee weir gauging station.	NRA Fish passage improved (for trout).	Costs.	Disruption to flow records.

Issue No.24:	BARRIER TO FISH MIGRATION - TALYBONT GAUGING WEIR		
OPTIONS	Responsibility	Advantages	Disadvantages
1. Install fish pass during upgrade to gauging station.	DCWW	Fish passage improved for trout.	Minor additional cost of refurbishment works.

Issue No.25:	BARRIER TO FISH MIGRATION - LLANGENNY LEAPS		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Minor modifications to weir required to improve fish passage.	NRA/Weir Owner	Fish passage for trout and salmon improved under greater range of flows. Exploitation of fish below weir reduced.	Costs. Weir ownership is unknown. NRA could become liable if modifications made.
2. Propose byelaw or rule to restrict angling in weir pool.	NRA	Exploitation of fish reduced.	Reduction in angling facility.

Issue No.26:	BARRIER TO FISH MIGRATION - PANTYMOEL AQUEDUCT (AFON LWYD)		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Install fish passage facilities at weir beneath canal aqueduct.	NRA/British Waterways	Access for salmon to spawning grounds improved.	Costs.

Issue No.27:	DECLINE IN SALMON STOCKS, ESPECIALLY LARGE SPRING FISH		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Enforce new fishery byelaws to control exploitation and to allow greater escapement to spawn.	NRA/Fishery Owners/Netsmen	Increased spawning and stocks, particularly spring fish.	Loss of angling opportunity. Reduced rod catches. Reduced commercial viability of net fishery.
2. Encourage catch and release of large salmon.	NRA/Fishery Owners/Angling associations	Increased spawning and stocks.	Difficulty in identifying best communication link.
3. Conduct feasibility study of a breeding programme to enhance spring salmon stocks.	NRA	Increased stocks.	Costs.
4. Improve fish passage at Brecon weir and other obstructions according to priorities and available resources. (see Issue 12)	NRA/Weir Owners/Fishery Owners	Enhancement of stocks by improving use of nursery areas.	Costs.
5. Facilitate discussions between anglers and commercial fishermen for a 'buy-out' of the commercial fisheries.	NRA/Fishery Owners/ Commercial Fishermen	Increased spawning and stocks.	Costs. Legal complexity.
6. Identify effect of piscivorous birds on fish populations through objective research.	NRA	Allows development of an informal control strategy.	Costs. Failure to protect fish stocks over the short term if effect of piscivores is limiting.
7. Issue licences to cull birds.	WOAD	Reduces predation.	Fails to protect bird species.
8. Comment, as requested, on applications to Welsh Office to cull cormorants and goosanders according to NRA Policy.	NRA	Protection of birds and fish stocks.	

Issue No. 28:	DECLINE IN BROWN TROUT STOCKS		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Enforce fishery byelaws (increased takeable size limit) to control exploitation and to allow greater escapement to spawn.	NRA/Fishery Owners	Increased stocks due to greater spawning escapement.	Loss of angling opportunity.
2. Act on the recommendations of the Brown Trout Strategy including controls on stocking, establishment of database, introduction of catch monitoring and effects of predators on stocks.	NRA	Increased stocks of natural brown trout.	Restrictions on stocking.
3. Implementation of Usk Brown Trout Investigation to establish status, cause and solution to perceived decline.	NRA/Fishery Owners	Identification of river specific problems and solutions.	Costs.
4. Encourage catch and release and bag limits for brown trout.	NRA/Fishery Owners	Increased spawning and stocks.	
5. Stocking of areas identified as underpopulated with Usk origin trout.	NRA/Fishery Owners	Regeneration of populations accelerated.	Habitat and water quality may be limiting criteria in some areas.
6. Identify effect of piscivorous birds on fish populations through objective research.	NRA	Allows development of an informal control strategy.	Costs. Failure to protect fish stocks over the short term if effect of piscivores is limiting.
7. Issue licences to cull birds.	WOAD	Reduces predation.	Fails to protect bird species.
8. Comment, as requested, on applications to Welsh Office to cull cormorants and goosanders according to NRA Policy	NRA	Protection of birds and fish stocks.	Practicality of controls.

Issue No.29:	IMPROVEMENT IN COARSE FISHING FACILITIES		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Encourage Fishery Owners to make river stretches available to coarse anglers.	NRA/Fishery Owners	Productive resource made available to coarse anglers in an area short of such facilities.	Possible conflict with game anglers. Possible inadvertent exploitation of salmonids.
2. Enhancement of coarse fish stocks in the Monmouthshire & Brecon Canal.	NRA/British waterways/Torfaen Borough Council/ Newport Borough Council/Angling Clubs	More coarse anglers attracted to fish canal.	Depends on Fisheries Policy of British Waterways/ Local Authorities. Possible conflict with boaters. Possible conflict with wildlife interests.

Issue No.30:	DEGRADED RIVER HABITAT		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Implement river bank and channel improvements where habitat is identified as degraded.	NRA/Fishery Owners/Land Owners	Increases productivity of catchment for fish and habitat diversity for wildlife.	Costs.

Issue No.31:	CONFLICT BETWEEN DIFFERENT RECREATIONAL USER GROUPS AND THEIR IMPACT ON WILDLIFE CONSERVATION		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Liaise with angling and canoeing representatives to facilitate the production of a workable canoeing access agreement.	NRA/WCA/UUFA	Informal agreement and legal position is clearly specified for canoeists.	Many canoeists do not heed or are not aware of regulations.
2. Improve communications with canoeists so that they are aware of legal situation and potential conflict of canoeing without permission.	NRA/WCA/BCU	Canoeists more aware of their obligations.	Costs. Difficulty of communicating to all canoeists.
3. Individual canoeists to be regulated via a licensing or permit system:		Individual, rather than block permission would raise the profile of the obligations and rules to be followed by each canoeist. A visible permit or licence would identify those who are aware of the rules to simplify regulations.	
3.a) NRA to introduce a licensing system.	NRA	Legal canoeing enforced by an independent and public authority. Income to NRA.	As there is no right of navigation, there can be no navigation authority, so the NRA has no legal authority to introduce a licensing system. Administrative and enforcement costs likely to outweigh income.

Issue No.31: (continued)	CONFLICT BETWEEN DIFFERENT RECREATIONAL USER GROUPS AND THEIR IMPACT ON WILDLIFE CONSERVATION		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
3.b) UUFA/Canoeing organisations to introduce a permit system as an extension to the access agreement.	UUFA/WCA/BCU	Legal canoeing encourages and regulated by those it affects and who have the legal authority. Possible income to respective organisations.	Requires commitment from canoeing and riparian interests to enforce regulations.
4. Provide advice to site owner and each user group to attempt to resolve conflicts and educate in good practice for the protection of the conservation interest.	NRA/Site Owner/ User Group		Resources used with minimum conflict and greater understanding.

Issue No.32:	USK BARRAGE PROPOSAL		
OPTIONS	**Responsibility**	**Advantages**	**Disadvantages**
1. Barrage construction approved.	Secretary of State for Wales	As defined by scheme applicants.	Impact on migratory fish stocks and ecology of the catchment. Others as defined by scheme objectors.
a) Fish Pass design and operation approval.	Welsh Office	Ensure optimum design of fish pass.	Risk of impact on vulnerable species.
b)Fishery protection and mitigation scheme derived.	NRA/Newport Borough Council/ Gwent County Council/Other statutory consultees	Protection of user interests.	Longterm cost implications. Potential impact on genetic integrity of stocks.
2. Barrage construction not approved.	Secretary of State for Wales	No adverse effect on fishery.	

Newport Transporter Bridge

ACKNOWLEDGEMENTS:

PHOTOGRAPHS OF CASTLE AT ABERGAVENNY, RIVER USK, CANOEING ON THE MON-BRECON CANAL COURTESY OF WALES TOURIST BOARD.

PHOTOGRAPH OF KINGFISHER COURTESY OF R.WILMHURST/RSPB.