

# Water for Tomorrow?

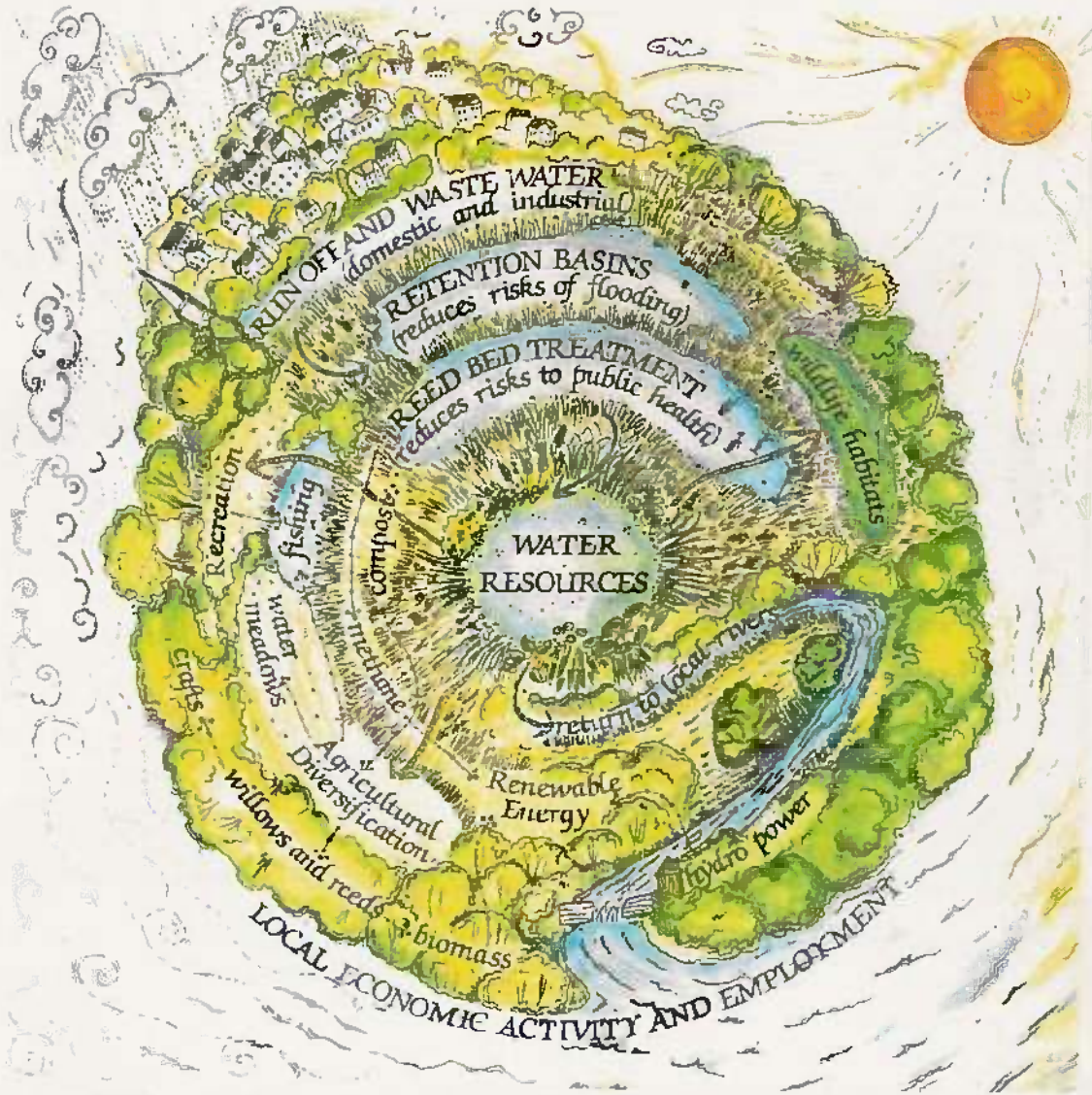


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## Issues and Actions for Gloucestershire

### Report of "Water for Tomorrow-Wetlands the Natural Solution"

A One Day Conference October 10 1997

@Slimbridge Wildfowl and Wetland Trust



ENVIRONMENT  
AGENCY



"Why is the water issue so important to you?"

"This year the crops nearly failed"

"Streams are drying up"

"General lack of awareness of the diversity and experience within the water industry"

"River low flow has impact on ecology and fisheries"

"I'm 90% water - approx"

"It's the key to most pollution issues"

"Water is not an infinite resource, and I am keen to learn more about sustainable water use"

"Health issues"

"Need to conserve flood capacity of river system"

"Ensure there is adequate water for everyone's need"

"Gloucestershire Wildlife campaign is called 'Water for Life'"

"Too little respect for water"

# Event Summary

On 10th October 1997 an unprecedented event took place at the Slimbridge Wildfowl and Wetlands Trust Conservation Centre, between Stroud and the Severn Estuary in Gloucestershire. This event brought together people with hundreds of years of combined experience working with and using water. Experience ranged from the water supply industry and water regulation to farming and business: local government to householders. It was a unique and first-of-its-kind occasion for ordinary people to meet with those who have had responsibility, in Gloucestershire and further afield, for water management and protection and to begin answering the question "How will we manage our Water for Tomorrow?"

Ninety people gathered to hear "expert" presentations, to present their own views and concerns and to work with other stakeholders to identify the changes which need to be made in their lives and work, in order to use water more sustainably in the 21st Century. For those individuals and organizations involved, see the delegate list

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# Actions Proposed

During the day delegates attended workshops on various aspects of the water issue reflecting their involvement or interest. Having discussed the issues relating to Water for Tomorrow in Gloucestershire, regionally, nationally and internationally, these "stakeholder" groups proposed positive actions to be taken. Delegates made individual commitments to take these actions forward.

## ACTIONS for Gloucestershire and associated regions

"Gather momentum - Oct 10th not just a one-off event"	Conference steering group
"Establish Water 21"	
"Link with existing groups, perhaps merge?"	
"Promote naturalistic methods and economic potentials"	
"Informal water users forum carry on Oct 10th work"	Ian Daycock
"Lobbying group for Gloucestershire to send report and briefing out to agencies not present on October 10 and try to involve them"	Noel Baker Simon Pickering
"Provide data useful for people in Gloucestershire"	Simon Pickering
"Raise awareness of what is going on already"	Simon Pickering
"Prepare local case studies to promote good practice and a sustainable water and wetlands resource approach (including economic implications) for farmers and landowners and for PR with local people (e.g. via schools FOOTPRINT scheme in 1998)"	Richard Green Mike Fletcher
"Energy 21 demonstration of water resource management"	Jackie Carpenter
"Gloucestershire Integrated forum for water/the environment"	Roger Wade Angela Whitfield
"Act like consumers- give the Water Companies feedback"	
"Encourage planning authorities to make policies for new development"	Melanie Watson
"Promote wetland benefits in development control using examples"	Andy Neale
"Get educated (all of us take responsibility for this) and distribute information"	Mike Simpson
"Water mapping involving schools, WIs etc"	Charlie Ryrle Tim Rogers Nadine Smykatz-Kloss Simon Pickering
"Liaise with Common Ground"	
"Newsletter to raise awareness and revenue"	Juffan Jones Graham Bond
"Restore canals and nullpands"	Tony Burton
"Hydro Action Group - promote Stroud Valleys Water"	Martin Alder
"Move Glos Biodiversity Action Plan forwards"	Colin Sudholme
"Promote awareness of the value of water - taking responsibility"	Simon Allen

# Wetlands the Natural Solution

## ACTIONS at a national and international level

"Lobby for changes and improvements in legislation"	Cheltenham & Gloucester College
"Abstraction licence review set against environmental criteria/consequences"	Graham Bryant Simon Pickering
"Support David Drew MP to raise water issues at Westminster"	
"Take strategic steps (via Water 21) to support MEP to develop an effective and sustainable water directive in the European Parliament"	
"Get water policies into forward plans at all levels e.g. structure plans, local plans, farm plans"	
"National wetlands inventory"	
"Government policy change to reduce N,P,K discharges"	Charles Tucker Paul Coupe Cheltenham & Gloucester College
"Get the water issue onto <i>The Archers</i> ."	Sue Coppard

# Summary of Presentations

## The Water/Wetlands Crisis - Two Views

**Dr Roger Wade - Environment Agency, Lower Severn Area, Tewkesbury**

There are 3 water supply companies with catchments that include parts of Gloucestershire - Severn Trent, Welsh Water and Thames. Welsh abstracts less than 10%. For Severn Trent, 40% is abstracted (only 10% from within the Lower Severn area of Gloucestershire). For Thames, there is a similar general pattern - but in this case all public groundwater (i.e. from the Cotswolds through to London) comes from the Upper Thames, Windrush and Evenlode. Groundwater drought is contributed to by low winter rainfall. Surface water drought by low summer rainfall.

Abstraction licensing was not subject to environmental criteria in its initial stages - and these "licences of right" are still operating. The 1975-76 Drought brought about hosepipe bans and drought orders, a shock to many - suppliers and consumers alike - but since water was seen as a public resource, there was a good public response. From 1977-87 there were above average water supplies and little expenditure on developing resources. The Droughts of 1988-92 and 1995-97 have seen a greater awareness of water abstraction impacts along with an expectation of greater supplies from water consumers who see the privatised resource as a "commodity". Together these pressures - shareholders/OFWAT versus the environmental lobby - creates the present water conflict.

Although agriculture accounts for 1% of abstraction (much more going to power generation and industrial use) its effect on small (rural) streams is pronounced.

Where there is not enough water in reserve (yield) for the water companies to support rivers suffering low flows, and where the problem is compounded by local abstraction "licences of right" being exercised watercourses can and do dry up. However, the demands supermarkets put on farmers for a consistent supply of large, water-rich produce (particularly potatoes) reinforce this state of affairs.

River-channelling increases the speed of floodplain-drainage and river-flow, which affects wildlife habitats negatively - particularly wading birds.

Development, if involving paving over an aquifer-recharging area, can also undermine water resources. Moreover runoff can increase and give rise to flooding or downstream ecological effects if uncontrolled. Urban runoff is often contaminated by oil, silt, leaves, dog faeces etc washed off the hard surfaces (by rain, itself potentially polluted).

The change from many small sewage works to few large ones has transferred flow further downstream in many localities, which has also made higher demands on the rivers' self purification systems.

In the countryside, agri-industrial farming has led to organic matter, nutrients, phosphates, nitrates and biocides running off exposed topsoil or through field drains or penetrating the groundwater. These can upset the ecology of watercourses and pollute public supplies. Agricultural drainage has adversely affected wildlife sites like Walmore Common, near Minsterworth.

## Wetlands the Natural Solution

### Julian Jones - Independent Water Consultant & Campaigner

We need to recognize the specific problems found in Gloucestershire. In the Cotswolds rivers and streams disappear for months on end: the Upper Thames; Ampney Brook; Upper Frome, Churn etc. And there have been reductions in the Small Scale Hydro turbine output at Coaley, near Dursley. And again, there have been 75% reductions in flows since the spring-fed hydraulic rams were installed in 1920 in Painswick. These are not unique instances and point to a significant and widespread decline of the Cotswold aquifer.

These disruptions impose serious economic costs on our communities: compromising, for example, the economic viability of trout streams and hydro-power; reducing agricultural and forestry productivity; causing structural damage to buildings (subsidence); affecting leisure and conservation; and possibly undermining public health through aerosol-borne infection. Overall the cost to the Cotswold community could be more than £50 million annually - money which could be used to improve water storage and availability (see table below).

As well as disrupted winter rainfall, there is a "conspiracy" of additional factors affecting aquifer recharge. Agriculture has played a major role. Draining of farmland, deep tillage, bare soils and removal of hedgerows since WWII has accelerated rainwater runoff and loss of topsoil (humus) which is the soil's water-retaining sponge. This is a "double-whammy" to water conservation and aquifer recharge. The run-off of humus causes algal blooms (often toxic) in our rivers, disrupting river-bed ecology and clogging millponds. The Gloucester hire Hydro Action Group has proposed to install a tilt-gate to control the river Frome at Ebley which would assist humus (silt) recovery. Water-strategic forestry has been neglected. Traditionally, in Britain and elsewhere, "sacred groves" are protected because of their positive effects on adjacent springs.

Housing development on floodplains accelerates runoff and reduces infiltration. The advice to gardeners to "concrete over their gardens" shows the poor thinking of some water companies. Draining of marshes and filling in of millponds, lowering of river levels and straightening of meanders have all contributed to disruption of local hydrologies in the name of development, allegedly for the benefit of people.

The monopolies on municipal water infrastructure presently offers the consumer no opportunity to act responsibly and responsively to local problems. We are prevented from recycling the valuable water and nutrient resource found in sewage. Rain could also be conserved rather than redirected into the sewerage system and out to sea. The wholesale changes to resolve the present unsustainable sewerage system will allow for future decentralization to realise additional small-scale sources.

Estimated Annual Cost of Water Abstraction to the Gloucestershire Community	
Agricultural and Forestry Productivity.....	£10m+
Small Scale Hydropower.....	£15m+
Public Health.....	£10m+
Leisure and Conservation.....	£10m+
Structural Damage to Buildings.....	£ 5m+
<b>Total.....</b>	<b>£50m+</b>

## Wetlands - What Are They?

Dr Simon Pickering - Conservation Policy Coordinator, Slimbridge Wildfowl and Wetlands Trust

The standard definition of a "wetland" is provided by the Ramsar Convention:

**"Areas of marsh, fen, peatland or water whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed 6 metres."**

Wetlands perform crucial functions, provide renewable products and have important attributes:

- **Flood Control**
- **Groundwater recharge**
- **Groundwater discharge**
- **Shoreline stabilization**
- **Sediment/toxicant retention**
- **Nutrient retention**
- **Water transport**
- **Water supply**
- **Fisheries**
- **Energy**
- **Wildlife/biodiversity**
- **Recreation/tourism**

The area of wetland in the British Isles has declined from 25% of the total landmass 2000 years ago to no more than 5% today - an enormous loss. Conservation and wise use of existing wetlands needs to be supplemented by constructed and re-created wetlands.

Slimbridge WWT has a constructed reedbed of 4 1/2 acres area which removes sediments and organic wastes from the 600000 gallons of water which flushes through the site where the wildfowl reside.

## The Potential of Wetlands

Professor Lucian Gill - Oceans Environmental Engineering and ESU Services Ltd

The water industry has been slow to pick up on the opportunities of horizontal and vertical flow reedbeds, and because of their unnatural monopoly on sewage treatment it has proved difficult to introduce this technology.

Industrial waste poses the most acute pollution threat to the environment. Historically it has been discharged directly to rivers and seas, or incorporated into the domestic sewerage system to be neutralised by the greater volumes of domestic sewerage. This prevents us from reclaiming the latter because of oestrogens, heavy metal contaminants etc, but only moves the problem "downstream". With Reed Bed Technology (RBT) industrial waste can be separated at source and processed through the soil based rootzone treatment of *phragmites* reeds. The reed rootzone creates a habitat for bacteria which is both aerobic and anaerobic - a unique combination which allows firstly partial breakdown of carbon and nitrogen compounds through oxidation followed by the final breakdown of nitrates etc in the anaerobic zone.



## Wetlands the Natural Solution

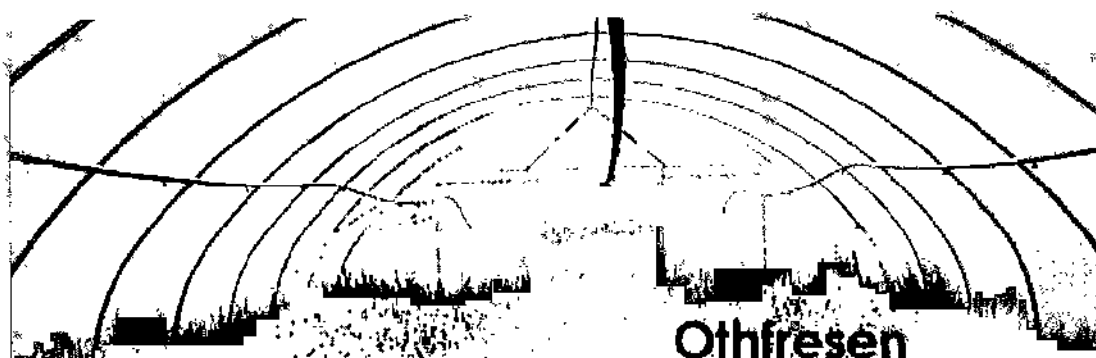
RBT provides greater reliability and lower costs than conventional treatment. Greater reliability because of the adsorptive qualities of the reedbed soil medium. This means that it is able to deal with toxic loads of up to 50 000 mg/l BOD - so accidental overloads can be accommodated which would knock out a conventional system. Lower costs because waste flow and degradation requires only gravity and the maintenance of a growing reedbed (solar powered!) meaning less energy input.

<b>RBT Emissions and Energy Balance</b> over a 16-year operating period, against a comparable conventional plant		
	Reed Bed plant	Conventional plant
Electricity consumption	25 230 kWh	39 970 000 kWh
Coal equivalent	17 707 kg	20 152 941 kg
CO <sub>2</sub>	46 747 kg	53 203 377 kg
NO <sub>x</sub>	71 kg	80 612 kg
SO <sub>2</sub>	124 kg	141 071 kg

Key factors in chemical and human waste treatment are selection of suitable reed subspecies and growing media and sampling/analysis of the leaf/stem to ensure there is no release of toxic compounds back into the ecosystem.

The Bullingham ICI plant has for 8 years demonstrated the treatment of toxic chemicals such as phenols and amines by RBT. Additionally farm wastes, landfill leachate, mine wastes and sludges can also be processed through this method.

Moreover, the figure below shows the success of RBT in treating the waste from human settlements. In this case, waste from Othfresen's 6 500 population, which has been processed with RBT since 1973.



	BOD	Inorganic Nitrogen	Ammonia	Phosphate
<b>Inlet</b>	<b>206</b>	<b>66.9</b>	<b>67.4</b>	<b>7.3</b>
<b>Outlet</b>	<b>&lt;2</b>	<b>1.6</b>	<b>0.7</b>	<b>4.0</b>

Illustration supplied by Oceans Environmental Engineering Ltd

## Charles Tucker - Environment Agency

Constructed wetlands have been used near Redditch to fill many of the functions previously detailed. The Wharriage Wetlands project involved the quality remediation of a water course below a 500 ha mixed residential and industrial development. This watercourse was required to treat run-off and episodic pollution events. A three-phased approach was taken - involving ponds and a wetland.

## Mark Moodie - Elemental Solutions

Vertical flow reed beds are essentially big flower pots with the planting medium of graded gravels with a top layer of sand to large stones at the base. The reeds are planted into the sand and live on year after year. The water is dispersed over the surface and the cleaner water is drained from the base. This is a way of using the minimum of area compared to the horizontal flow reed beds. Some take unsettled sewage, most take settled effluent and there are those specially for sludge. Occasionally these are suitable for industrial effluents. Slides of all of these were shown in different countries and in different seasons.

However we must remember that the reed beds will not accept anything thrown at them. They need to be designed for the load they will be taking. This points to the responsibility of the people using the system. Systems can be smaller if people are aware of their role in the cycle of pollution and regeneration. Water saving such as the low flush loos and showers shown can work just as well as modern systems and sometimes even better but they save water. Prevention can be increased by using waterless toilets. The simplest design does not meet the relevant standards but many are up to the 'porcelain standard' and smell even less than a standard WC.

This can all be done by legislation and metering, or perhaps it can be done out of awareness and respect for water. Wells and springs use to be sacred and there is a school of thought which can apply modern consciousness to rediscovering the spiritual qualities of water. The practical implication of these are the Flowforms - slides of which were shown, from across the world.

# Wetlands - the Cornerstone of Sustainable Growth

David Drew - MP for Stroud

Water, as an issue, is increasingly moving up the political agenda and there is no more apposite time for such a conference as this. I am delighted with its progressive format. Today individuals and representatives from all areas are encountering one another's points of view, and engaging in instructive dialogue. I am particularly pleased at the way Gloucestershire's own Agenda 21 process, Vision 21, continues to steer enthusiasms in the direction of real change, and that the Wildfowl and Wetlands Trust has seen fit to host this process.

My main purpose however is to introduce Julian Jones, who, of all the individuals concerned with water resources, stands out as one of the most committed. Over the years he has helped me realise the importance of the politics and economics of water. More than anyone he has convinced me of the validity of using reed bed technology to deal with pollution problems, at a fraction of the cost of "traditional" technologies, in an effective and environmentally-friendly manner. As much as the issue of water pollution, I have also been made aware of the problems of abstraction and poor use of water supply. What is clearly needed to tackle these problems are the high levels of participation exemplified by the event here today, new technologies such as reed bed systems, and a holistic awareness of the wider water issues

## Julian Jones

Taking the holistic - the widest - view we must accept that water management and supply is in crisis in many parts of the world. Locally, there are evident problems, as the previous presentations show. However, a holistic view also shows us that natural systems are both resistant to temporary upsets and more complex than any man-made technology as well as benign and productive at every stage.

Without forgetting the sound principle of municipal sewerage - to exclude pathogenic waste from drinking water supplies - there are more sustainable and sensible pathways for waste (and rainwater) than the present system.

The present system compels the public to subsidise farmers, through the Common Agricultural Policy, to apply artificial NPK fertilizers, to pay the water companies to dispose of the natural nutrients in our sewerage; and again to pay to have excess NPK removed from our drinking water.

At the Claypits, near Eastington, there are open drains running with raw sewage. Some 5 years ago it was proposed to pump this sewage to a local sewage works, at a cost of £250,000 - the scheme was not carried out. By aiming to utilize the NPK fertilizer in the claypits sewage, "set-aside" land adjacent to the village can grow a wetland willow biomass crop. For an installation cost of less than £25 000 half the village's energy needs could be grown, within an attractive park/public amenity, which could itself produce highly-cleansed water for low-grade re-use,

## Water for Tomorrow?

as well as buffering rainfall. This function was historically carried out on much of our agricultural land (thus "sewage farm") and could be once more. Instead of farming set-aside grants, spare land near settlements could be used to farm water. The privatization of the water industry has "fossilized" the water distribution system and made it resistant to necessary change.

### What is needed for Water Sustainability:

- **Acceptance of the criteria for change**
- **Researching the historic baseline (50-100 years ago) of river flows and water tables.**
- **The involvement of the community - as specified in the UNCED Agenda 21**
- **Audit of all existing water resources (springs, lakes, watercourses etc)**
- **Audit of potential water-related resources (NPK nutrients, biogas, biomass, small-scale hydropower)**
- **Definition of water resource enhancement measures, using a decentralized approach (segregation of rainwater, domestic and industrial waste, proper return of wastewater to the biosphere, recycling of humus and nutrients to land)**
- **Structural planning to restore historical baseline (millponds and reservoirs, forestry, silt-traps, constructed wetlands)**

# Issues and Potential Solutions

Each stakeholder workshop identified key issues and solutions

## Stakeholders interested and active in “Communities”

political researcher, local politician, community trainer, community reed bed specialist, green retailer, environmental educator, founder of WWOOF, writer on environmental issues, landscape architect, Gloucestershire community members, Environment Agency staff, water consultant, water engineer, Gloucestershire Wildlife Trust

### Issues

- How do we convince the powers that be that there is another way forward?
- Need to educate regulators to pass on knowledge and check that communities are OK
- We need a new structure for water resource management
- Authorities willingness to accept new solutions
- Millions being wasted on high-tech approaches
- Lack of control that we have
- Education within communities- local communities need to be aware
- Need to be inclusive
- Schools spend more on water than electricity
- Town planners have responsibility to be aware
- Opportunities for restoration of mill ponds and canals

### Solutions:

- Every school to have a demonstration of water conservation
- Talks to community groups
- Community sewerage systems
- Household action - personal rainwater capture
- Create a culture of respect for water resources and use of water
- A local public body such as the Women's Institute to undertake research and counteract corporate providers (local not central)
- Community projects to map water and wetlands, wells and springs and feed the information to providers - to encourage a sense of awareness and belonging

Get water issues and wetlands on the "Archers"

Encourage personal responsibility

Structure Plan and Local Plan policies part of consultation

## Stakeholders interested and active in "Farming and land ownership"

farmers, land agent, local authority landscape architect, researchers, environmental graduates, Environment Agency staff, educationalist,

### Issues

Climate change is happening but are we planning for the consequences?

Farmers have a key role to play in future improvements in water management. They manage the "sponge" which captures, holds and cleans water. They influence the effectiveness of water courses. They need information and technical guidance.

Changing back to a historical golden age for water resources may not be feasible- it would cause substantial changes to farming businesses - e.g. arable farms on old flood plain wetlands.

We need a baseline of what is the water situation now. Water, a vital resource, is being "managed" with very little data. Farmers may be able to help with historical records but maps do not seem very accurate guides. Agencies such as the drainage boards should have old data about former wetland sites. We need to know how much has been drained. The Environment Agency has some computer models about water in Gloucestershire. Is our farming practice helping or exacerbating the problem?

Need to target specific problem areas in Gloucestershire.

Why are rivers in Gloucestershire drying up? We need to know the causes.

We notice that the wetland habitats are declining. Historically this was caused by grants and Government proposals for drainage and increased production and flood control. The statutory job of the drainage boards across Gloucestershire has caused habitat loss. Indicators of loss of wetland pasture include the decline in the Redthorn population.

Funding is wholly inadequate. It will cost money to rebuild structures and improve the water resource potential of Gloucestershire land. The Countryside Stewardship and Environmentally Sensitive Areas Schemes need more money and need to include water and wetlands enhancement (not damaging existing features). Need grant aid for reservoirs for winter storage.

Advice needed on effective designs - ponds and reed beds need intelligent design and could serve several roles to control storm flow, clean waters and maintain biodiversity.

Groundwater abstraction is an issue of concern especially in the Cotswold hills. Effects on streams and rivers and wetlands are noticeable. Farmers are well placed to observe long term changes.

Aware that some key agencies did not attend today - Internal Drainage Board

Structure plan and planning interpretation and rules need to support farmers and landowners to take steps on sustainable water management. For example, make it easier to put in sizeable wetlands and ponds of say 0.25 hectares. Is there a strategic approach to water in the structure plan?

Need to start again with water legislation. Abstraction licenses should be based on environmental criteria. Need a campaign for legislative change and overcome the issue of compensation payouts to water companies. The Environment Agency has a role, but also need a local and democratic input

Agencies need to show farmers the economic benefits of adopting sustainable water management initiatives and reduce the red tape in actually doing it.

## Wetlands the Natural Solution

Instead of approaching just individual farmers it may be wiser to look at a system approach. For example promote a scheme for a water course and involve all landowners and link funds to this

Farmers need practical examples relevant to the situations on their farms- for example the pros and cons of putting in a reed bed to cope with a 120 cow unit.

### Solutions

Campaign for the local plans and structure plan to improve sustainable management of water resources - encourage the development of structures to store and manage water

Statutory and legislative changes needed to support a change in abstraction (linked to environmental criteria). This needs to be backed by money to pay for a shift towards sustainable water resource management

Water companies hold small licences but these are not used. These could be switched back to communities to enable small scale and locally managed water systems.

Bring some form of local democracy into the Environment Agency

Establish a lobbying group on water issues for Gloucestershire and start with the agencies not attending today

Establish an informal water users forum. We want to meet again and make further progress

Educate farmers and landowners through providing local Gloucestershire Case Studies which illustrate the issues and are relevant to a range of farm and community conditions. Must include clear costing and longer term benefits.

Provide **positive information** about what farms are doing for Gloucestershire Schools especially through the FOOTPRINT scheme - water is a focus in 1998. The public need to hear more good news from the farming community and farmers would benefit from the good PR.

## Stakeholders interested and active in "Business and Industry"

water engineer, trainers, Birds Eye Walls, Hyder Consulting, researcher, environmental consultant, Councillor - District and County, County Council Officer, hydro energy specialist, Renewable Energy Company.

### Issues

Need vision and an aim that everyone behave responsibly towards water and care for it

Regulatory power and basic legislative framework need improvement. The Environment Agency needs teeth. The Environment Agency can say "don't do things". they cannot say "do things". OFWAT have not attended today.

How can we link local initiatives to Central Government?

Need to encourage us to take responsibility for our water

Paying for things brings a feeling of respect. Need to change the "water is free" mind-set - how can we do this? Water bills concentrate the mind and helps to educate people. New houses have meters. Some group members have meters and some are applying.

Make domestic rules similar to business rules (but this could cause social difficulties)

## Water for Tomorrow?

Propose to reverse tariffs for energy and water. The more you use, the more each unit costs - perhaps have a basic ration free.

Water companies do not want transparent payments - people will buy less

Does money give people the right to buy things? Economic power can get things done but there is a conflict as greed for money makes things worse. Measuring just in economic ways is flawed for a resource like water.

### Solutions

Measure water issues and water industry targets not just in current economic terms

Renewable energy - locally and smaller scale would save UK water supply used to cool large power stations - figure not sure but perhaps 36% is used for this

Antagonism by people (consumers) influences the water companies.

Raising the cost of water would result in increasing respect for it. Businesses would go for reed beds because it is a energy saving option, and low maintenance, saves money over 3 years. Tip sites could be transformed to green. Businesses would look for options to recycle water.

## Stakeholders interested in and active in "Wildlife, and Recreation"

wildlife and wetland specialists, environmental education specialist from the Wilderness Centre, Environment Agency (Upper Thames and Somerset), conservationists, landscape architect involved in habitat creation, Severn Trent, Gloucestershire Wildlife trust.

### Issues

Valuing what we already have and avoiding turning wetlands into ponds

Education for landowners and others on what a wetland is

Lack of data on which to make decisions - this should include making designations in a local context

Local planning and decision making needs to include environment and wetland issues

Need a shift from a radicals only action- wetlands should become a political opportunity locally through offering incentive payments to develop wetlands

Many opportunities to develop new wetlands BUT where will the water come from,

Increasing recreation demand

Fragmentation of habitats due to built development; especially in Stroud streams culverted and development right up to the banks

Can't go back to what we had - need to create new habitats (linked)

Lack of consensus over what the created habitats should be

Removal of engineered structures will not give us back what we had



## Wetlands the Natural Solution

### Solutions:

If habitats are created they should be self sustaining - this needs better planning and management

New wetlands should be appropriate in location and not at the expense of existing habitats

Planning for new developments and mineral extraction should make sure external demands do not dictate local developments

Integration is needed between agencies, Local Agenda 21s, and interested parties, to co-operate on planning decisions and implementation

Need to assume development will happen and seek the best balance of social, environmental and economic needs

Biodiversity action plans (including wetlands guidance) should be developed as a supplementary PPG (Planning Guidance) in local plans.

Need funding for research, surveys and monitoring once a specified need has been identified (for example, the water vole)

Shift of emphasis for existing incentives towards funding for basic habitat enhancement. Funds could cover capital, management and maintenance. Funding could come from developers (planning gain), the Environment Agency, Landfill tax.

Identify key players and activists in water locally and raise awareness of local issues

Give those with knowledge of ecosystems more influence or raise their status (for example, get elected as councillors)

## Stakeholders interested and active in “Regulatory groups”

**Gloucestershire County Council Staff, Environment Agency staff, District Council Officers, Water Consultants, Severn Trent, researchers, Swindon Borough Council**

### Issues

Water is a resource not a commodity

Need to take positive steps on wetlands to restore old ones and develop new urban ponds

Cropping on the flood plains needs to be reconsidered

Need socially acceptable metering and charging for luxury use

Give preference to community based solutions

Making use of sewage sludge

Labelling of domestic products

Nitrogen, Phosphate and Potassium levels from sewage works and agriculture.

### Solutions

Promote wetlands in development control

Encourage small developments to use wetlands for waste water treatment

Encourage forests to retain surface run-off

- Re-negotiate licence quantities
- Provide Government-funded compensation
- Statutory action to reduce leaks
- Give guidance on wise water use in local plans, specifications, building proposals and designs.
- Encourage re-use of water in wasteful processes
- Mobilise consumer choice in favour of wetland creation and buffer zones
- Financial incentives to wetland management and creation- keep money in the countryside
- Promote environmental objectives for agriculture such as nitrogen sensitive zones
- Need an environmental plan for a geographical area - catchment based to encourage partnership and co-operation with elected representatives and likely to encourage and support community action. This should be agreed and adhered to.

# How We Worked Together



The conference was designed by a steering group brought together by Vision 21 it represented a partnership of groups all committed to Local Agenda 21 and sustainability. Members were drawn from Gloucestershire County Council which hosted meetings, the Wildlife and Wetlands Trust, Vision 21 volunteer group, Vision 21 local authority liaison group, Stroud District Council, Stroud Hydro Action Group and the Environment Agency. The day was designed to encourage participation and further actions by the stakeholder groups present. Six key elements informed the overall design:

## The South Pinger Reedbed at WWT Slimbridge

1. At the start of the day guidelines for working together were established to assist delegates.

WWT Slimbridge is "home" to 3,000 tame wildfowl as well as many thousands of wild birds which take advantage of the food and safety offered by the Centre. Inevitably, the 600,000 gallons of water flowing through the site gains both organic waste and particulate matter. This water eventually passes back to the River Severn but WWT is concerned to ensure that it is restored to at least the state in which it first came into our grounds. Indeed the consent from the Environment Agency to discharge the water to the river sets standards for Biological Oxygen Demand (BOD) and sediment content which we are legally bound to meet.

<b>Guidelines</b>
<b>We will put energy into:</b>
<b>seeking positive solutions</b>
<b>listening to each other</b>
<b>understanding other points of view-looking for common ground</b>
<b>making commitments to take action in Gloucestershire</b>
<b>allowing everyone spaces to have a say</b>

WWT has chosen to use a reedbed to ensure that it meets the standards it has also taken the opportunity to allow waterfowl habitats which are of value to wildlife. The site covers four and a half acres and work was completed in 1994 following the award of generous grants from the DOE Environmental Action Fund and the BOC Foundation for the environment.

2. Facilitators from Vision 21 were on hand to help the process.

3. Case studies were presented for a range of situations and involving individuals, business, communities, landowners and regulators. The South Pinger Reedbed is thus designed to remove sediments and breakdown organic wastes into environmentally acceptable compounds and to provide habitat for a range of wetland animals not necessarily found elsewhere on site.

4. Presenters were asked to prepare to be questioned and to respond to action proposals.

Sediments - low energy (slow moving) open water zones facilitate the settlement of sediments as do the rhizosphere (root and rhizome zone) and the substrate - these act as filters, further depositing sediments.

5. The stakeholder workshops were designed to encourage exchange of ideas and commitments to action.

**Introductions**  
**who you are**  
**why you have chosen this workshop**  
**Key observation so far today**  
**What are the issues?**  
**Solutions and positive steps we (and others) can take**  
**Actions needed (for us to commit to)**

The reedbed system is made up of a number of different areas which perform the tasks described above:

6. To encourage networking and exchange of ideas there were opportunities throughout the day to meet other delegates. Personal Description Forms were filled in by many delegates, details included "Name", "What I would like you to know about me", "Why the water issue is so important to me", "What I have noticed about water where I live", "The most constructive result to achieve by the end of today would be" and "What I can offer". These were displayed throughout the day.

## Wetlands, the Natural Solution

The pond is designed to be large enough to carry on this task for the next 25 years. During this time, the depth of the pond will decrease as it is colonised by emergent plants and eventually reeds. These, together with the deposited sediments, will eventually fill the pond. We will then need to decide either to dredge it out or leave it as a reedbed.

The pond provides habitat for dragonfly species which like open water. It is also one of the last water bodies to freeze in winter, making it very useful to ducks.



**The Treatment Beds** - plant stems, the sediment and the leaf litter all help to break down organic wastes and further reduce sediment levels. There are three different areas, each taking the same amount of water. They are shallow - about 10 to 15 cms deep - and water takes about 3½ - 4 hours to move through them. A comparison is being made of the effectiveness of the different beds. They are:

**The Phragmites, Mosaic and Yellow Flag Beds** - the Phragmites (Common Reed) and Yellow Flag Beds are made up of single species whilst the Mosaic Bed contains a variety, each planted in discrete clumps. The beds are surveyed to record their attractiveness to wildlife and also their effectiveness at treating the water passing through them.

In addition, treatment will also occur in **the Harvest Bed** - an area of reeds which is being cut experimentally on one and two year cycles. The aim of this is to assess reed quality and the impact of harvesting on its ability to "treat" the water. Having reeds of varying ages will also provide a variety of habitats and the harvested material will be used to make, for example, reed screens for the Centre. Water is not currently being pumped through this area but will be once we have collected sufficient data on the functioning of the other treatment areas.



**Raft Lagoon** - reeds and other plants have been grown on floating rafts so that their root systems hang like curtains into the water. Water is forced underneath this so will be exposed to the bacteria living on plant surfaces. They will continue to break down organic wastes



**The Cascade** - a chalk boulder dam was constructed so that, as water flows over it, its greater oxygenation and dissolved calcium carbonate will help to precipitate phosphates. However, in practice the surface of the rocks has been covered by a "biofilm" of algae thus blocking the desired action. Back to the drawing board on this!



**Lagoon 2** - with planted aquatics. This is the final settlement lagoon and is providing habitat for aquatic invertebrates

## Water for Tomorrow?

8. **Polishing Beds** - one contains reedmace and the other Phragmites. They discharge water into a gravel lined collecting channel from which water passes to a rhine and eventually out to the River Severn.

Water is regularly sampled at the point of discharge from the Polishing Bed. It now meets the environment Agencies' requirements as to sediment levels and BOD. Eighty percent that 1.24 billion litres of water have passed through the reedbed and that 78,000 kgs of suspended materials has been deposited. Faecal gut bacteria counts for our wildfowl show populations of up to one million per 100 mls of water - 99% of these are killed or removed after passage through the reedbed. Water leaving the reedbed is safe to bathe in but not to drink - this would require chlorination and be inappropriate, given that the water is returning to a natural water system which contains bacteria.

Management of the reedbed includes keeping paths clear; ensuring that single species areas remain so; keeping inlet and outlet areas open; servicing the pump. Survey work has covered plants, moths, birds, invertebrates and mammals. Fourteen species of dragonfly have been seen; Badgers and Water Voles use the area; there are now 25 pairs of Reed Warblers and numbers of Sedge Warblers and Reed Buntings have increase. Water Rail have been seen and may be breeding but this has yet to be confirmed.

*For further information about WWT, please contact Alison Byard, WWT PR Officer  
WWT Slimbridge, The Wildfowl & Wetlands Trust, Slimbridge, Glos GL2 7BT  
Tel. (01453) 890333 ext 279 Fax: (01453) 890827*

# Displays at the Conference

## Formpave Ltd

### POROUS PAVING ALLOWS WATER TO DRAIN THROUGH

Formpave has worked with Coventry University to develop a unique porous paving system which allows rainwater to infiltrate from car parks, pavements and other hard surfaces, controlling its eventual distribution, either into sewers, water courses or the water table.

Surface ponding is eliminated, and the pollution of watercourses by runoff does not occur. The quality of the water that is ultimately discharged is greatly enhanced and is suitable for secondary use.

Concrete block porous pavers are bedded on 6mm of clean stone. Undemeath is a geotextile membrane which filters the water into a specially designed sub-base.

Formpave can be contacted at:  
 Lufftorn Avenue  
 Coleford  
 Gloucestershire GL16 8PR  
 Tel: 01594 836999  
 Fax: 01594 810577

## Elemental Solutions/The Green Shop

**Aquamon** - a polythene wastewater treatment system. Attached to conventional or low-flush toilets it delivers the solid waste to a **composting chamber** for natural decomposition, whilst re-routing the liquid component to join the rest of the household wastewater. The chamber requires emptying every one to three years.

**Rainwater filter** - filtration units, with selected pumps and tanks, save the use of mains water in washing machines and water toilets.

**Low-flush toilets** - As little as 2 litres of water per flush is needed. Most suited to systems using roofwater or a private supply, but can be connected to standard plumbing.

Through water saving technologies an average household can reduce its domestic water usage by two thirds.

Contacts:

The Green Shop  
 Brisley  
 Stroud  
 Glos  
 Tel: 01452 770609 770270

Mark Moodie Elemental Solutions  
 Oaklands Park  
 Newnham  
 Glos GL14 2ET  
 Tel: 01534 516063  
 Fax: 01534 516821

## Hyder Consulting Ltd

Hyder has over 3300 technically or professionally qualified staff working on water infrastructure around the world. Whilst satisfying immediate and pressing needs, new infrastructure construction has to be weighed against the benefits and disadvantages to society.

Hyder's integrated approach to clients' problems ensure creative, practical, innovative and environmentally sound solutions.

The specialist environmental departments within the company provide services for environmental management, water management, land use, air quality and analytical testing, across the country. The Bristol office's technology-based multi-disciplinary service underpins environmental protection, pollution control, project facilitation, consumer protection, management of health and safety and contamination microbiological analyses.

Locally, Hyder prepared the Avening Sewage Treatment Works scheme which includes reed beds for stormwater and additional tertiary treatment. They also work with clients outside the water companies - industry and smaller community projects.

Contact:

Martin Whaley  
 Hyder Consulting Ltd  
 70 Redcliffe St  
 Bristol BS1 6AL  
 Tel: 0117 9881609

## Wetlands the Natural Solution

The following organizations and individuals were invited to attend but were unable to do so, although most expressed an interest. We look forward to their positive involvement in the continuing work of Vision 21 and the people of Gloucestershire relating to the water issue.

OFWAT (the water industry regulator body)

MP for Forest of Dean

MP for Tewkesbury

MP for Gloucester

MP for Cheltenham

MP for Cotswold

MEP for Bath & Bristol

Thames Water

Welsh Water (Dwr Cymru)

MEP for Cotswolds

MEP for North Wilts

Ministry of Agriculture, Fisheries and Food

Farming and Rural Conservation Agency

District Councils' Planning Officers

Internal Drainage Board

English Nature

Property developers

*This report was prepared by Conrad Young and Diana Ray of Vision 21  
Vision 21 is Gloucestershire's Local Agenda 21, working with the people of Gloucestershire to achieve sustainable  
development. It can be contacted at:  
Tel: 01242 224321 Fax: 01242 221274 e-mail: office@vision21.demon.co.uk*

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