



Chalk Stream Headwaters Forum

28th November 2011

Transcript of Proceedings

Introduction

Tim Jackson – Principal, Sparsholt College

Tim Jackson welcomed everyone to the event. Sparsholt were pleased to be able to host the event and he welcomed some of Sparsholt's students who were attending.

Lady Wakeham – Patron of the Vitacress Conservation Trust

Lady Wakeham welcomed everyone to the 5th Annual Forum.

Tim Nevard – Trustee of the Vitacress Conservation Trust

Tim Nevard outlined the programme for the day and urged attendees to write their questions on post-it notes provided in the attendee pack, and place these on the wall at the back of the room. These would be discussed in the panel session after lunch. The post-it comments are listed at the foot of this document.

'Rivers of the Future' (How Climate Change and Human Activity might affect River Ecosystems)

Dr Andrew Johnson – Centre for Ecology & Hydrology - Wallingford

Dr Johnson described a model that characterises river flows and presented results for two rivers from a modelling exercise to consider the likely impact of future climate change on the Thames and the Aire/Calder catchment near Leeds. The model suggested warmer winters and hotter, drier summers will decrease flow in all seasons on the Thames. Mean flows and Q95 low flows were considered. Water temperatures in the Thames were examined. The general indications are that flows will go down and air temperatures will rise under climate change. Reduced flow and less dilution would lead to higher baseline pathogenic viral concentrations but more sunlight leads to greater inactivation with viruses. There is more research taking place looking at algal blooms in the Thames using the Questor model. The Thames at Abingdon was examined in 2009. Predicting algal behaviour is still proving difficult. Perhaps greater tree shading would be more cost effective. Will the higher organisms such as fish, get smaller? Some potent pharmaceuticals might harm fish. The Aire/Calder catchment near Leeds was examined. The predicted effects of chemicals were considered. Although, not a problem at the moment, this could be an issue for the future. There could be more inter-sex fish, if concentrations of oestrogens rise in the water. Warmer temperatures may increase immune responses but will enhance pathogen growth rates in infectivity. Overall, there will be a greater stress on fish from disease in the future. The British river in 2080 will have less water than now, will be warmer and will be greener. There is potential for



concentrations of potent chemicals such as contraceptives, to get too high and for disease to be introduced by alien fish.

Q. Tom Davis *T&I / Wessex Rivers Trust*

We have looked at phytoplankton. What is your explanation for the mismatch between predicted and actual numbers?

A. Certain algae have higher temperature maxima that may not be well-described by the model.

Q. Graham Burgess *Local resident living near watercress bed*

What about the effects of day length? Are algae affected by day length?

A. I don't think it's a day length issue with algae. We're expecting longer, larger, spring blooms

Q. Terry Langford *University of Southampton*

Trees can reduce temperatures by 8 degrees in the summer. How are you looking at this at the Thames?

A. We looked at incident light with algae numbers and believe that shading could be a valuable mitigating factor.

'Reading between the Riffles' (Submerged Aquatic Plants as indicators of Environmental Stress in Chalk Streams)

Alex Poynter – Hydroecology Research Group, University of Birmingham

Issue considered – 'submerged aquatic plants as indicators of stress in chalk streams' in the Itchen. Environmental stress leads to 'chalk stream malaise'. Aquatic macrophytes are useful as indicators but there are difficulties, for example, taxonomic clarification. The PhD study is entitled 'Impacts of environmental stress on the River Itchen *Ranunculus* community'. This is jointly funded between the University of Birmingham and the Environment Agency. It is a 6 year study looking at 28 sites along the River Itchen. The plant community is being assessed. Alex Poynter displayed graphs showing community abundance over several years. *Ranunculus*, *Berula erecta*, *Callitriche* and *Cladophora* were examined. The effect of different water flows on these were examined and further work includes looking at improvements in survey techniques such as utilising aerial mapping as a potential macrophyte survey method, considering response of other chalk stream macrophytes and looking at how to combat confounding variables e.g. swan grazing and cutting.

Q. Alan Frake *Retired from EA (Environment Agency) Wessex*

It's not just low flows but nutrients have effects too, have you looked at this?

A. We have incorporated nutrient doses to see what happens. I would think high nutrients will cause high algae growth. Flow is the overall controlling factor.

Q. June Chatfield *British Naturalists' Association and Chair of Northern Way Trust*

Have you considered the possibility of dormant seed population?



A. This is something we would like to investigate.

Q. Andrew Johnson *Centre for Ecology and Hydrology*
Was it flow rather than phosphate that you were manipulating?

A. Yes. Flow is the more critical factor. Algae cannot easily get a hold in high flow/high phosphate conditions, but flow is the main factor.

Bourne Rivulet Initiative (Progress Report)

Professor Gail Taylor – VCT Chair and University of Southampton

Professor Taylor listed the members of the Bourne Rivulet Initiative (BRI) and explained what its aims are. The current activities included commissioning of a new research PhD which Dr. Pete Shaw talked about later, restoration work on the east channel (Lower Link farm, St Mary Bourne), a 2 year electro fishing study and scoping of a wetland study. Part of the improvements to the east channel involved redirecting a road drain to a sediment trap and desilting the channel, then backfilling with stone and gravel to introduce sinuosity. Southern Water have implemented a pump solution to 11 properties in St Mary Bourne that had been affected by sewage flooding. This has resolved this specific issue but not the wider one of SW wishing to discharge untreated sewage to the Bourne in times of high groundwater levels. The BRI want to carry out a full hydroecological survey to identify rising springs and develop a proposal to drain them to the stream, away from the leaking sewer. The BRI are also looking at developing a wetland. WWT consulting have produced a scoping study. BRI have funded this through the Vitacress Conservation Trust support.

Q. Michael Payne *NFU Watercress Association*
I'm interested in what a good ecological status looks like. EA looks at macrophytes and not fish.

A. This was an area where data was scant and so we had investigated fish populations, but EA also covered the other major categories as part of their past on-going monitoring.

The Upper Itchen Initiative (Progress Report)

Graham Roberts – Hampshire & Isle of Wight Wildlife Trust

Graham Roberts talked about the members of the UII and its remit. He said that the group had quite a few riparian owners, which is good. He listed the key themes of the group e.g. low flows, diffuse pollution and eutrophication. There were two main statutory drivers responsible for the River Itchen – SSSI and SAC (Site of Special Scientific Interest and Special Area of Conservation). The EA and Natural England were involved. There was also a duty of care by the County Council and Local Authorities. The Water Framework Directive (WFD) has assessed the ecological status of rivers. Graham Roberts thanked Nigel Thomas-Childs for all his help. Alresford Pond is a particular concern. It is a failing SSSI, now about one third of its original size due to silt deposition and its outflow is causing elevated temperatures and P levels in the upper catchment. There is a serious decline in Gammarus numbers. The Review of Discharge Consents was due to be completed by December 2012. Graham Roberts said that we needed to get people involved in the River Itchen to secure long-term improvements. We need to challenge the UK Government via Brussels, through the failure to deliver the EC Habitats Regulations. Maybe we



needed a high profile media campaign. We needed to increase the evidence base and explore opportunities for the reduction of inputs.

Q. Martin Burton *Hampshire Water Partnership*

Benchmarking is an important process. A set of indicators is used to benchmark the river. This can be used as our baseline for measuring rivers.

Q. Andrew Johnson *Centre for Ecology and Hydrology*

Which toxic chemicals appear to be the key issue?

A. Chlorine appears to be a culprit below watercress packing plants on the Itchen.

‘Following up the Clues’ (Report on PhD research on the role of Phosphorus in the decline of Chalk Streams)

Dr. Pete Shaw – Centre for Environmental Science, University of Southampton

Dr. Shaw gave a project status update. This is funded by the Vitacress Conservation Trust with support from the Test and Itchen Association. PhD student Arthur Leung was due to start in January 2012. There was an additional £18,000 of funding from the University of Southampton. The sites looked at were the Arle, Candover, Cheriton and Itchen. Dr. Shaw displayed a graph showing phosphate concentration in these 4 sites. This was generated from Arthur’s earlier MSc. The project looked at how phosphate varies according to the condition of the river. Dr. Shaw summarised by saying that the Arle and Itchen have the highest phosphate levels, those in the upper Arle being particularly high. But he stressed these were snap shots. The relationship between phosphate and flow is not clear. It was important to examine daily concentration and flow. The Arle contributes more to the phosphate content than other tributaries. In 1994 there was a change in the pattern of phosphate concentration, could anyone explain why? The 3 main tributaries only account for half the phosphate in the Itchen at Easton so where does the rest of the phosphate come from? The PhD will try to answer these questions.

Dr. Shaw thanked the EA for the provision of data.

Q. Andy House *Wessex Water*

Is the increase in flow due to ground water?

A. We don’t know but hope to find out

Q. Peter Evans *Advisor to SMB Parish Council*

How will you take into account point charge discharges?

A. We will examine the scale of variation. We will be doing 24 hour sampling at 1 hour intervals and we will look at the issue of septic tanks.



‘Putting it into Practice’ (The River Wensum Restoration Strategy)

Dr. Rob Dryden – Environment Agency, Ipswich

Three pilot schemes were implemented over the past few years on the River Wensum in Norfolk, where all river SSSI units were in an unfavourable condition and a comprehensive Restoration Strategy has been prepared on a reach by reach basis. Two of the problems are that: 46000 kilolitres of water a day is abstracted and 67% of the river is impounded by mill structures. Pilot scheme 1 involved Bintree trout fishery. Dr. Dryden talked through the issues and their restoration techniques which included filled mattresses and flow deflectors. Pilot scheme 2 was the Pensthorpe meander connection. A series of gravel glides were implemented. Some natural berms were built and a plug in the main channel to divert flows was implemented. Pilot scheme 3 was the Ryburgh end channel restoration. This involved 1.3km of channel length so was their most ambitious project to date. Dr Dryden described what sort of monitoring had been done. There had been a large increase in the numbers of fish in the new channel built as part of pilot scheme 2. Information on all this can be found on the EA website under River Wensum Restoration (<http://www.environment-agency.gov.uk/homeandleisure/wildlife/114676.aspx>).

Q. John Bass *Wessex Chalk Streams & Rivers Trust*
What was the total cost of these 3 pilot schemes?

A. £420,000 altogether. £120,000 of this was for the 3rd (and most ambitious) project.

Q. Lawrence Talks *Environment Agency*
How have you got on with the Mill owners on the River Wensum?

A. We are working with the asset management team and mill owners to lower the water levels. We have done some trials at the mills and dropped the level in the river by a few metres to see how the velocities are affected.

Q. Andrew Johnson *Centre for Ecology and Hydrology*
The impact of the restoration schemes looked dramatic. Are you still failing WFD (Water Framework Directive)?

A. I would hope not. Not sure why diatoms are failing. We are meeting SSSI conditions and hoping that P levels will go down.

Panel Session (Discussion and debate from the floor with responses from a panel of experts, facilitated by Tim Nevard– Trustee of the Vitacress Conservation Trust)

The panel was comprised of Professor Gail Taylor, Alex Poynter, Dr. Andrew Johnson, Dr. Rob Dryden, Dr. Pete Shaw and Graham Roberts. Tim Nevard examined the post-it notes that attendees had placed on the wall during the Forum and identified some common themes.

‘Can we influence decision makers with scientific evidence alone?’

Graham Roberts said that over the years we have tried to involve the relevant politician who is in Government at the time but then they move on. We cannot make progress with the current structure. Need a challenge to Europe. Should be led by an independent group and issues taken to Brussels. The



salmon issue has succeeded with some legal challenges. We need written support. The issue is that investment is needed in rivers. Alex Poynter said that there was a need to take the issues to higher powers. Tim Nevard asked for a show of hands to indicate who was in favour of such a campaign – around 50% of the audience were in favour.

‘We can’t do it all and can’t campaign on a wide front – so what are the priorities’?

Tim Nevard asked Dr. Andrew Johnson for 2 key priorities. Dr. Johnson said preserving the natural environment. Maintenance of flows was a major issue and how to improve the quality of sewage effluent but balancing this against pushing up energy consumption. Professor Taylor said that the flow issue was discussed 2 years ago at this Forum. We need to be more challenging. The need to build more houses conflicts with the saving of chalk streams. Dr. Dryden said that abstraction in the River Wensum had been an issue but that there were moves to reduce abstraction levels. Shirley Medgett for the EA said that it was important to keep this in context. Phosphate levels have dropped off but some rivers were still considered to be ‘healthy’ even though P levels were high. The issue should be placed in a historical context to see where we are now. Maybe we need a prioritisation exercise. Martin Burton suggested we could use benchmarking as a means of identifying gaps in chalk stream quality. Dr. Shaw thought this was a good idea but was doubtful about who would listen to the findings when gaps were identified. Martin De Retuerto asked whether the pre-cautioning principle still existed. Could we afford not to do anything? He said that the habitats directive seemed to have been replaced by the WFD which wasn’t as robust. Paul Knight said that scientific evidence isn’t going to win this. By using an environmental lawyer in Scotland, we have made some progress. We have to make people think about the environment and the only way to do this is to enforce something legally. I would like abstraction as a priority issue. Charlotte Hitchmough said that Offwat are consulting about water charging. The consultation is open until the end of February. Details are on the Offwat website, 2nd item about consultation on water charging. The 3rd part is all about types of charging.

‘If all the water mills were operating we could use them to generate hydropower’

Mick Hedgeworth said that if sluices are kept open then silt would not accumulate. Dr. Dryden said that he didn’t think it would be a good idea. We need to stand back and see how we can use all these resources for the best advantage to the environment. Robin Mulholland said that the concept that the days of the mills were great for fly fishing is a myth. Abstraction in Wiltshire will be improved. He was not despondent about his part of the world. Steve Rothwell said that aquifer recharge was inhibited by poor planning regulation allowing increasingly large impermeable areas (roads/buildings) to drain to river rather than into the chalk.

‘Concerns about Alresford Pond’

Graham Roberts said that we were looking forward Dr. Shaw’s studies at the University of Southampton to come up with some answers. He believed that the EA were looking to fund a feasibility study about putting it right. Dr. Shaw said that there was a big concern about phosphorus. Professor Taylor challenged Graham Roberts to hold a town meeting about the Pond as residents didn’t appear to know about this issue and just how bad a state it is in. Graham Roberts said that we need to win over the landowners first. There wasn’t a huge public benefit to the Alresford residents of cleaning up the Pond. Dr. Shaw suggested that we could leave the Pond as it was and it would turn into a natural wetland. June Chatfield asked where the online ponds had come from. Does one not have to accept that ponds will change? Dr. Dryden said that online ponds were a barrier to fish migration. Tim Nevard mentioned the issue of increased use of sewage sludge in agriculture. Tim Nevard asked if anyone was monitoring seasonal increases in infections due to algae etc. Steve Rothwell asked what was the most relevant form of phosphorus to measure? Dr. Shaw answered that it was soluble reactive phosphorus (SRP); and second to that was total phosphorus in rivers. Shirley Medgett said that they measure SRP. Steve Rothwell said if we’re only looking at one species of phosphorus then we may not have the whole picture. Dr. Johnson said that he thought that flow was the main reason for chalk stream malaise.



'How do we get better at combining public and private concern?'

Tim Nevard posed the question: 'should targets be high on chalk streams?' Andy Croxford said that we do as best as we can across all waterways as per the Government have instructed us. Maybe Rivers Trust should do the lobbying. Tom Davies said that in the case of the Upper Itchen, we're talking about getting from poor to good. It is acceptable for the Government to have a strategy to bring rivers up to a standard but we have an international resource in our chalk streams. I think we should target these as there is financial resource available.

Ivor Llewelyn said that we don't want to just concentrate on chalk streams. There's a whole range of rivers that need saving. Given time, trout will adapt but we need to plant trees for shade. Tim Nevard said that biological monitoring needs to be longitudinal. Dr. Johnson said that long term monitoring was very important. Datasets are vital. You should start simply when modelling. He would like to see monitoring of the hydrology of chalk streams and phosphorus in rivers over 5 years. Dr. Shaw said that we should have a common focal point. We need sentinel sites and around that, surveys on special areas of concern. Five years may not be long enough.

Graham Burgess said that we have a common product – water. There must be a strategic plan with internet links etc. Must have a brand name and make people see a perceived benefit. Peter Evans said that it was important to find out how headwaters react to climate change. Hydroecology was very important. Graham Roberts asked that everyone in the room should get involved. We cannot do it on our own.

Dr. Shaw said the question was, 'do people care about rivers'? Get all your family involved in rivers. Dr. Dryden said that we need to sort out historical maintenance processes and converse more with landowners. Alex Poynter said that more engagement with the public was needed to get things moving. Dr. Johnson said that we should get water quality into our culture as do the Swiss. We could maybe get landowners to let the public view their streams. Professor Taylor said that to make these streams future proof we need to understand biodiversity then we can have streams that adapt to the future. We need to compare the streams' genetic diversity. Bob Thornton said that they had got their local MP involved. Maybe we should influence our MPs more. There is an all-party water group. Demonstration test catchment data for Avon is available online.

Tim Nevard closed the meeting by thanking everyone for attending and asking that any comments should be emailed to vct@soton.ac.uk

Post-Its

Paul Knipe Test Valley Resident & Naturalist – Are we papering over the cracks? The fundamental issue is the source of catchment water rivers need managing as a single system as they have been for centuries!

Denise Ashton – In a period of low flows, how do we manage expectations of mill channel owners on flow. Will mills leads be sacrificed to preserve the main river?

Patan Guani – Chlorine discharge limits do not measure accurately enough to meet EC salmon targets. No measure is taken of chlorine byproducts by salad washing above Alresford Pond

Mick Hedgeworth If rivers were OK when all the water mills were operating, why don't we put them back into use generating hydroelectricity. No more stagnant water!

June Chatfield – My involvement is King's Pond in Alton – a mill pond to a paper mill that ceased working a century ago. It has also a large number of waterfowl including Canada geese, whose droppings add to the nutrients. The management is ongoing. Town Council own pond. I got heritage lottery grant to dredge in 1997 but it will need doing again. It was probably 'self-cleaning' when the mill was in use but not now.



June Chatfield – Biological Monitoring. A need for long term data. Northern Way Trust has river wardens who vary in their background, but have 20 years plus of data. Need to enthuse and train local folk and to rope in the youngsters as well as us “pensioners”. Our latest recruit is a part time mature student here at Sparsholt doing conservation ecology, a young 30 year old. Data processing also takes time.

June Chatfield – Mill use went out a century ago. Some structures forgotten, still in place. 13 mills once on this stretch of river with channel modifications. How to manage the post milling era but retain historical heritage.

Steve Rothwell – Abstraction is still a key issue. Alresford Pond – what is the best measure of its health to apply our limited resources to? Should it not be the ASTP score?

Steve Rothwell – What is the most relevant form of phosphorus to measure in chalk headwaters? Do EA measures of TRP miss too much?

Bob Thornton – Oliver Heald, MP from Hertford has taken an interest in the poor state of the River Beane. Does anyone have any evidence that MPs from different areas with similar interests communicate with each other for form a more effective lobby?

Diana Davidson – Climate change. Planned development. Water quality. Have projections been made combining the consequences of ALL integrated challenges?

Diana Davidson – Has any public health analysis been conducted on seasonal increases in viral and bacterial infections related to local water and river quality? Flow? Temperatures?

Diana Davidson – London night soil and sledge injection is increasing as petrochemical based costs of traditional fertilizers become prohibitive. Has research been undertaken on this increasing trend in local agriculture on water quality?

Andy Croxford – How can we get better at combining public and private resources (money, people, influence) to improve the local environment?

Paul Knight – We have heard nothing today about predation. Low flows, lack of weed (cover) make fish highly vulnerable to increased predation which will affect WFD classification. How can we link the science (low flows will increase fish production – presentation) with reality on the ground?

Paul Knight – In support of Graham’s presentation, can we influence decision makers with scientific evidence alone or do we resource a legal precedent to create a “sword of Damocles” over those who might wish to “by-pass” environmental protection?

Martin Burton – Can we use benchmarking as a process for identifying the current status of chalk streams, identifying the “gaps” in performance and possible solutions? Benchmarking – identifies status at a point in time, compares similar rivers, identifies “gaps” in performance and possible solutions.

Peter Evans – Assessment of large scale abstraction on seasonal downstream and upstream flow, especially in “high stress” areas and also projected climate changes. EA comment? Also in respect of P variability.

John Baker – On line lakes in headwaters – these are clearly a serious problem especially when full of sediment. The EA and NE seem unable or unwilling to take effective action where the owner is unwilling.



Is there a solution? P monitoring – is there a simple, inexpensive and reliable method for measuring soluble phosphate we can use?

Need to prioritise what we do – trying to do too much too thinly will mean we don't achieve anything. Phosphorus from septic tanks first!

“We know what's wrong?” There is a plethora of issues, but limited resources. Some issues must be more important than others. Need to focus on priorities.

Do we know what toxic compounds are in the sediment of Alresford Pond? Do we know their source? And how do we stop them impacting downstream?

Phosphate monitoring – There is considerable evidence of considerable variation in phosphate levels, temporal and geographical over whole lengths of rivers. Is there a case for encourage public phosphate level monitoring? Equipment is available and techniques are not difficult to learn. The accumulation of a large database could help to inform research and renewal projects. Similar to the Anglers' Monitoring Initiatives we need Phosphate Monitoring Initiation.