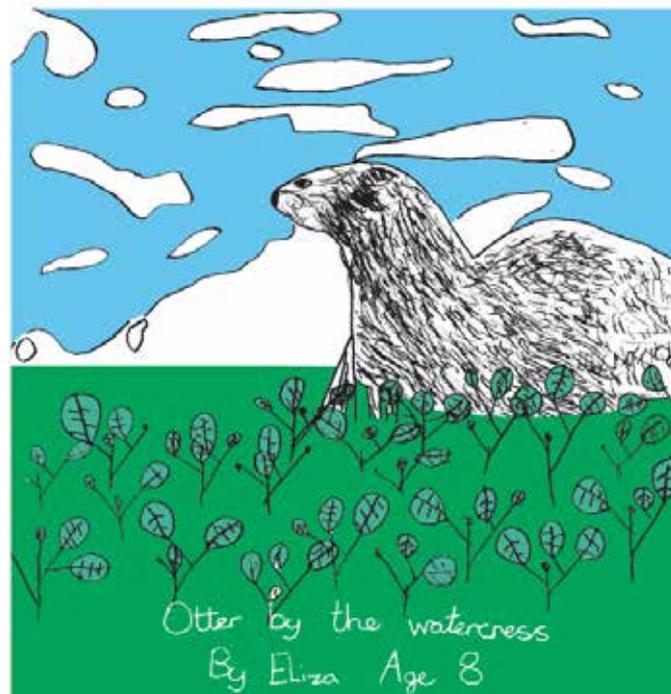


7th Chalk Stream Headwaters Forum

THE VITACRESS
CONSERVATION
TRUST



Sparsholt College, Hampshire
Monday 25th November 2013

Forum Proceedings

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Morning Session

Welcome

Lady Wakeham (Vitacress Conservation Trust Patron)

Lady Wakeham opened the 7th Chalk Stream Headwaters Forum by welcoming everyone present and explained the importance of the Forum in providing practical solutions to the ongoing problems apparent on many English chalk streams. Lady Wakeham provided a short speech on Chalk streams and highlighted the problems that conservationists are faced with during riverine restoration. The importance and the problems associated with phosphorus pollution on English chalk streams were also highlighted. Lady Wakeham said that a particular aim of this conference was to spread the word and find practical solutions that contribute to the reduction of phosphorus, and improve the quality (water & habitats) of chalk streams.

Introduction

Tim Nevard (Vitacress Conservation Trust Trustee)

Tim Nevard stated that the Vitacress Conservation Trust prides itself in getting things done as a result of these annual conferences. Understanding the influence and importance of current research and legislation is paramount to moving forward and finding practical solutions to problems. For this reason, leading researchers of multiple disciplines have been invited to contribute a scientific perspective in relation to real issues and problems facing chalk streams, leading to the success of the Forum over the past six years.

Tim Nevard underlined that the majority of attendees are practical conservationists, interested in delivering 'hands-on' outcomes. This enables informed discussion of the wider implications associated with chalk stream management, and the highlighting of issues that are sometimes overlooked.

A panel session is scheduled for the afternoon to discuss the issues raised throughout the day and to propose viable resolutions. He introduced the first invited speaker, Robin Chase of Atkins Global.

Presentations 1 & 2:

1. ***“Now follow that - A large scale CRF funded river and reed bed project for the Pensthorpe Conservation Trust” - Robin Chase (Atkins Global)***

The project is of a 3km stretch of the River Wensum SAC and its floodplain, focusing on the creation of 3 floodplain reedbeds covering an area of 8 hectares. The presentation focussed on the importance of working alongside government, voluntary bodies, business and third parties to arrive at a holistic approach to river restoration.

Baseline monitoring has been carried out throughout the restoration in order to monitor the effects on fishing and invertebrate populations. The Environmental Agency and Natural England have showed particular interest throughout, due to the river failing to achieve 'good

ecological status' under the Water Framework Directive and the object of the project to correct this.

Particular works included the narrowing of the river to increase the velocity of flow and reduce sedimentation, along with reconnection of the floodplain creation of the reedbeds, as well as the remodelling of an internal drainage board (IDB) channel and the interception and retention of polluted urban runoff.

2. “*The impact of Phosphorus and Septic Tanks on Chalk Streams*” Alex Poynter (University of Birmingham)

This work was carried out in response to requests from previous Forums, in order to focus on septic tanks, and their subsequent contribution to nutrient inputs. A main objective was to build an understanding of relative phosphorus levels and how they affect river ecology in the River Itchen. Potential implications of septic tanks and domestic sewerage were a focal point of study.

This study also looked at watercress farms and fish farms as sources of phosphorus in the headwaters of Itchen, and the contribution they make to riverine phosphorus levels, focusing on ‘available’ and ‘potentially available’ residuals. Fish populations and macro invertebrates were also observed.

A study focussing on household detergents containing phosphorus, and the subsequent impact/contribution they have to river phosphorus levels are also incorporated.

Results showed that tributaries of the Itchen are showing: (i) elevated levels of phosphorus; (ii) current phosphorus monitoring is inadequate; and (iii) there is limited awareness on the impacts that phosphorus is having on river ecology

Questions from the floor:

Question from Graham Roberts to Robin Chase:

How much did the river restoration on the Wensum cost (both Pensthorpe’s 3km stretch and the whole 8km of restoration)?

Response:

Pensthorpe’s budget for installation was £400,000. Not sure of the EA cost because most of the work on the Wensum is carried out internally by the EA and costs are made available at the landholders and EA’s discretion.

Question from Ron Allen to Alex Poynter:

Have you focused on the existing influence on ground water of phosphorus levels, for example the supply from boreholes and other sources?

Response:

Sources of phosphorus from groundwater are generally low and also difficult to assess. The present study focuses on sources of phosphorus of a greater impact. However, evidence

suggests that phosphorus levels from groundwater do exist. Levels of 0.02ppm have been recorded in the Itchen. A figure 0.01ppm is regarded as acceptable.

Question from Peter Evans to Alex Poynter:

How can you attribute phosphate to any given source, because you need to know the total mass flow of phosphates? These are a result of both concentration of phosphates, and the flow. On watercress beds there is no metering on abstraction and also the EA do not test for discharged volumes?

Response:

There will always be a compromise when understanding exactly what to measure and when to measure it. It is very difficult to take into account all contributions of phosphorus. The exact traceability of phosphorus can also sometimes be difficult to understand. This study highlights potential sources of phosphorus that are able to be monitored and controlled effectively in order to reduce their impact. A detailed hydrological survey would perhaps explain in more detail the concentrations of phosphorus in relation to water flow.

Question from Alan Frake (WTT) to Robin Chase:

Have you paid any attention to how efficient the reedbeds would be in reducing levels of phosphorus? Where they designed with this in mind?

Response:

We have looked at this. The reedbeds do have some effect in reducing levels of phosphorus from urban sources, however a reedbed of approximately 600 hectares would be needed to deal with all the urban runoff from Fakenham.

Question from Roger Harrison to Alex Poynter:

A lot of research suggests that phosphate levels from household sewage are from dishwashers. You cannot buy phosphate replacement dishwasher products, so what do you propose?

Comment from Graham Roberts:

The Hampshire and Isle of Wight Wildlife Trust recently distributed an article explaining this issue in order to increase public awareness and pointed to alternative products.

Question from Paul Knight (Salmon and Trout association) to Alex Poynter:

How were measurements taken in relation to the present study? A degree of variability can be attributed to concentrations of phosphorus.

Response from Charlotte Rose (Natural England):

Phosphate standards under the water framework directive differ from those of SAC Sites and SSSI sites. The Environment Agency are monitoring in order to identify levels under the water framework directive however the levels they are finding are still failing SAC and SSSI requirements.

Question from Lawrence Talks (Environment Agency) to Alex Poynter:

How good/effective are septic tanks at removing phosphates? Is there any guidance to optimise the performance?

Response:

Perhaps not as good as they could be. They are very good at removing biological compounds; however most phosphates will be present in the outflow, even in well-maintained systems.

Comment from Tom Davis:

Soakaway operation is vitally important to the efficacy of septic tanks when considering the removal of phosphorus through absorption. Septic tanks have reduced efficacy with age, and many systems currently in place are being used well beyond their life expectancy.

Question from Tim Nevard to Alex Poynter:

Are septic tanks being used currently in new planning applications in the UK, as they have been illegal in North Queensland for around 15 years?

Response:

Septic tanks are being installed currently.

Question from Trevor Bond to Robin Chase:

The figures quoted for the restoration of the Wensum seemed astronomical, and out-of-reach for many people/clubs/organisations. How transferable was the expenditure, and could the job have been achieved at a lesser cost?

Response:

Considering the significant volume of earthmoving involved to reverse the misconceived river engineering of past generations, the River Wensum restorations have been extremely cost-effective. However, it has also been a learning experience. Significant costs have been saved during several operational aspects: planning, logistics, engineering and as we learn more, there will no doubt be additional economies available.

Close for morning coffee...

Presentations 3, 4 & 5:

3. “Update on the Bourne Rivulet Initiative and ongoing Forum-inspired Phosphorus Research”- Dr Pete Shaw (University of Southampton).

Dr Shaw focussed on two problems currently affecting the Bourne Rivulet area around St Mary Bourne; namely sewers and proposals for new wetlands in conjunction with river restoration.

There are significant current problems in St Mary Bourne associated with inadequate existing sewage systems; causing leakage and the subsequent contamination of groundwater and surface water (eg cracked sewerage pipes).

Dr Shaw highlighted the high cost of maintaining and repairing an antiquated sewerage system and indicated that current mitigation measures involve high cost solutions such as ‘tankering’ of sewage and ‘over-pumping’. He also indicated that the Bourne Rivulet Initiative had retained the WWT to look at the potential to create a multi-functional wetland in the vicinity of St Mary Bourne - providing multiple benefits such as enhancement of local biodiversity and improvement of water quality.

Phosphorus research involves the identification and the classification of various types of phosphorous, focusing on reactive and unreactive matter, and the effects they have on water quality and aquatic biota.

4. “Update on the Upper Itchen Initiative” - Graham Roberts (*Hampshire & Isle of Wight Wildlife Trust*).

A particular aspiration of the Upper Itchen Initiative is to ensure that all water users are responsible for either maintaining or improving the quality of water at the point of discharge, especially throughout SAC sites. Graham Roberts’s presentation focused primarily on improving water quality and the associated contributing factors, especially filamentous algae causing reduced biodiversity and potential eutrophication.

A high biomass of invertebrates is a key aim of the Upper Itchen Initiative. The UII also addresses the need of a more holistic approach to water quality management and highlights diffuse source pollution as a particular area for concern.

The implementation of new EA regulations stating that all watercress farms will be regulated in terms of phosphate, ammonia and BOD discharge is a key opportunity. A consultation period ending 3rd January 2014 has been announced, which the watercress industry should respond positively to, setting a responsible and positive recovery trajectory for chalk streams.

5. “The Effects of Cattle Grazing on Chalk Streams” Trevor Bond (*Environment Agency*).

Trevor Bond’s research aims to increase awareness of the effects of cattle grazing on English chalk streams. Morphological impact was discussed, such as bank topography, as well as the effects on nutrient changes/input, in relation to possible sedimentation and subsequent changes to aquatic bio diversity of flora and/or fauna. Particular arrears of concern, as a direct result of cattle behaviour, were explained, such as herbivorous transition and excretion impacts.

The implications associated with the management of cattle in order to optimise their associated modification of sensitive habitats were also addressed.

Key findings were that cattle appear to cause no loss/change to bankside structure, although cattle trails are often depicted as highly erodible. Turbidity wasn’t significantly affected by cattle entering the water and/or crossing the river. Furthermore, cattle were shown to contribute to heterogeneity, and to improve the quality of chalk streams, so long as optimal cattle intervention/stocking densities are maintained.

Questions from the floor:

Question from Paul Knight (Salmon and Trout Association) to Pete Shaw:

Did you take any quality controls of the samples that you took during testing?

Response:

All samples were taken and then frozen, and subsequent subsamples were taken from that sample. We tried to take fresh samples wherever possible. All samples were tested and specific intervals to assess if there was any change associated with storing or freezing. No more than a 20% change was witnessed. For research purposes this is acceptable.

Comment from Tim Nevard:

Would you benefit from any more samplers?

Response:

Yes. Sampling takes time. Someone to provide one or two samples per week would be beneficial.

Question from Graham Burgess to Pete Shaw:

I live next to a river where there have been corroded gas pipes leaking as much as 5% gas into the river. What impact could this cause?

Response:

The infrastructure that we have is antiquated. Therefore a lot of the systems we have in place, such as the septic tanks, were designed before phosphorous was used in detergents. Gas pipelines can also similarly be old and in need of refurbishment/replacement.

Question from Paul Knight (Salmon and Trout Association) to Pete Shaw:

Graham Roberts mentioned that a particular form of unreactive phosphorus could settle out over time. Is it a problem that not enough focus is been given to unreactive phosphorous?

Response:

Yes it may be a problem, however there has to be a compromise when doing research. The majority of phosphorus has been studied and understood in a reactive state, one could question that researching unreactive phosphorus for 3 years or more until it became reactive could be questionable in terms of feasibility.

There are apparent gaps in knowledge throughout all aspects of river ecology; what we have to do is to work with the polluters and to make them aware of the impacts they are having. Possible solutions need to be addressed and implemented.

Question from-Robin Mulholland (piscatorial society) to Graham Roberts:

What did the feasibility study of the dredging of Arlesford pond show?

Response:

Most of the outcomes lead to more studies, and it's going to cost a lot of money to implement. We are now looking at alternatives, effectively taking it off-line from the river

and rechanneling the main water source. This, coupled with more strict discharge consents for the people inputting into the pond, is perhaps a possible step forward. However this is a privately owned pond and landowner has to share the same views.

Question for William Daniel (Famous Fishing) to Graham Roberts:

Are the proposed phosphorus readings set by regulatory bodies playing into the hands of the polluters?

Response:

Yes, we have until January the 3rd to influence that decision. The proposal should be on total load of phosphorus, and not just on set concentration limits.

Question from Mike Blackmore (Wild Trout Trust) to Trevor Bond:

Does soil compaction increase surface run off?

Response:

Yes cattle grazing can cause soil compaction. However, most rivers are disconnected from compacted areas due to them been perched and therefore are not badly affected.

Comment from Mike Blackmore:

Did you not look at rivers that are not perched?

Response:

No. It's important to look at scale when doing research, and it was deemed that the majority of the rivers within the present study were perched.

Question from Robin Chase (Atkins Global) to Trevor Bond:

What controlled cattle access to the river? Was it modification or was it fencing? Was it a preferential route or did the cattle find their own way? If so would we be better reshaping the bank in order to provide preferential access as opposed to building fences?

Response:

Cattle naturally use areas of least resistance (eg. Riffles) to cross the river. This causes problems because these are often areas that are most sensitive. I would agree that influencing cattle entry to the river by shaping the banks can be successful.

Question from Tom Davies (Wessex Chalkstreams and Rivers Trust) to Trevor Bond:

You mentioned cattle poaching would be beneficial at the 'right' stocking densities. What would you recommend?

Response:

On a typical English chalk stream floodplain I would recommend 1 livestock unit per hectare, however there is some debate as to whether this is economic.

Close for lunch...

Afternoon Panel Session:

Tim Nevard indicated that the format for the 'Panel Session' had changed slightly from previous years. The afternoon involved a total of 7 panellists who were asked questions from the floor regarding any relevant issues or points raised from the morning session.

Panellists:

Tim Nevard - Chair (*Vitacress Conservation Trust Trustee*)

Professor Gail Taylor (*University of Southampton and Vitacress Conservation Trust Trustee*)

Graham Roberts (*Hampshire and Isle of Wight Wildlife Trust*)

Dr Steve Rothwell (*Watercress Industry and Vitacress Conservation Trust Trustee*)

Trevor Bond (*Environment Agency*)

Robin Chase (*Atkins Global*)

Dr Pete Shaw (*University of Southampton*)

Questions from the floor:

Tim Nevard noted that the topic of phosphorus levels within chalk streams has been at the forefront of discussion at the Forum for the last three years.

The Environment Agency and Natural England are currently putting in place regulatory measures that seek to cap the concentration of phosphorous within chalk streams to 45ug/L above groundwater level (20ug/L). The watercress industry has been made accountable for a significant contribution of phosphorus, and therefore, both the Environment Agency and Natural England are requiring the industry to reduce phosphorus levels at discharge points.

The focus of the Panel Session will therefore be on this 'hot topic'.

Question from Tim Nevard on behalf of William Daniel (Famous Fishing) and Peter Evans:

Should we looking at regulating the levels of phosphorus in English chalk streams by annual average concentrations; because this plays into the hands of polluters?

Response from Dr Steve Rothwell:

I have been speaking to the Environment agency and NRA before them for over twenty years about phosphorus input into rivers, with only negligible success and/or progression, and yet within the last few months, a 45u/L upper limit has been set. This reading is to be taken at a one off point in time, without any reference to flow rates or duration. We should be concentrating on the key loads of phosphorus on a particular river, and its subsequent effect on that river, as opposed to 'set' concentrations/limits of inputs.

Comment from Tim Nevard:

Is this what is meant by mass balance, and do you think this is a better approach?

Response:

Yes, this would provide a better understanding of the actual impacts of phosphorus on rivers, as specific concentrations will affect some rivers, and indeed watercress farms, more than others.

Comment from the floor:

Having set limits that have to be adhered to, is a starting point in order to regulate the amount of phosphorus that is discharged into rivers. Yes, understanding the mass balance of each river in terms of nutrient loading and its subsequent affect would be beneficial. An adequate understanding of the effects of phosphorus can still be understood through routine concentration monitoring.

Question from Tim Nevard to Dr Pete Shaw:

What are your views in relation to the monitoring technique of phosphorus on chalk streams?

Response:

There will always be a compromise. To measure load we will have to monitor both the discharge volumes and the concentration regularly. This requires extra monitoring, and therefore practicality may be an issue.

Question from Tim Nevard to Dr Steve Rothwell:

So would there be any practicality issues surrounding the implementation of mass balance monitoring of phosphorus, and could it be implemented?

Response:

I am not against moving towards a mass balance monitoring programme for phosphorus inputs, it would be far better than a concentration led control and indeed – the industry would be willing to contribute to the costs of such programmes. However, the current upper limits to concentrations proposed by the Environment Agency cannot be achieved on farms as they stand and spikes in phosphorus are expected in relation to seasonal variability. In short, this would require many watercress farms to dramatically change operational strategies. Some farms may close under these constraints.

Comment from Graham Roberts:

An annual monitoring programme will not fully understand the implications of phosphorus on English chalk streams. A concern of set upper limits will also hinder the future progress to reduce the loading of phosphorus.

Comment from Tom Davies (Wessex Chalk Streams and Rivers Trust):

There was supposed to be legislation in place to regulate watercress farms by March 2009. This has not been done, and therefore pressure is mounting as to actually get something in place. I would like to see a total load approach to phosphorus. A step by step process to review concentration limits would perhaps lead to a total load approach, and this I would be happy with.

Comment from Charles Barter (Chairman – Watercress Association):

We fully support reductions in phosphorus, however, we need time to implement changes.

Comment from Charlotte Rose (Natural England):

Accepted levels of phosphorus within both SAC and SSSI sites are currently under review. A reduction from 45, to 16 micrograms/L is expected, in order to comply with ‘high quality status’ under the Water Framework Directive.

Comment from Dr Steve Rothwell:

These levels would be practically unachievable – current borehole concentrations are 20 micrograms/L. Watercress farms therefore would struggle to reach the proposed targets set under SAC and SSSI sites. These levels are being pushed forward too quickly.

Question from Tim Nevard to Dr Steve Rothwell:

When were you advised of the limits of phosphorus? How long have you had to implement the changes needed?

Response:

There have been discussions over many years. However, what was always understood was a figure of 100micrograms/L SRP annual average, however no legislation was implemented. Over the last 2 years, these figures have changed dramatically, to 60ug/L SRP then with a sense of urgency to 45ug/L TRP plus inflow level within the last year.

Comment from the floor:

Typically, the industry said that flow measurements couldn’t be ascertained at discharge points? What has changed, and why is the industry now seeking to take into account flow rates at discharge points when testing for phosphorus?

Response from Dr Steve Rothwell:

The goals have changed. Regulation on one off concentrations is inappropriate unless the volume and duration is factored in. Total load is what we need to cut.

Question from Tim Nevard to the floor:

It is generally believed that the occasional spike in phosphorus is not detrimental to the ecology of the river. However, many farms may exceed the upper limit of 45ug/L during an occasional spike, and are therefore in breach of legislation. How should the regulatory bodies mitigate the risks imposed from spikes?

Comment from Tom Davies (Wessex Chalk Streams and Rivers Trust):

Recirculation. This would ensure minimal discharge, and reduced phosphorus input into rivers. To what extent could the industry recycle more water?

Response from Dr Steve Rothwell:

Over time it would be achievable. However, massive capital costs would be encountered as a result, and therefore, this is not a short term solution.

Comment from Graham Roberts:

There is a mechanism for all interested parties (consumers, retailers etc.) that may be willing to subsidise the costs associated with the holistic approach to reducing phosphorous levels, by increasing the price of produce.

Comment from Kerry Evans (Environment Agency):

Public investment has already accounted for massive inputs into private companies such as Southern Water. We are now asking for the industry to provide further/additional contributions.

Comment from the floor:

The industry is using natural resources for financial gain. They have to look after these resources. Anything more than zero phosphate contribution from the industry should not be acceptable. Adaptations to the modus operandi of the industry need to be urgently implemented.

Comment from Christopher Saunders Davis:

We need a longer consultation period. The industry would struggle to implement the changes needed to meet the 45ug/L limit within the time period given. In many cases, expert guidance would be needed.

Question from Tim Nevard to Charles Barter (Chairman – Watercress Association):

Does the industry accept that it needs to reduce the amount of phosphorus it discharges? There is an apparent argument over methodology needed to reduce phosphorus, and the subsequent timescale thereof. What timescale would the industry require to implement the changes needed to commit to reduce phosphorus in English chalk streams.

Response:

Yes it does. Phosphorus levels need to be reduced. However, there have been discrepancies/uncertainties over actual acceptable levels over recent years. The industry accepts this issue needs addressing; however, it feels the expectancy of watercress farms is too great, over too short a period. Three to five years would be a realistic timescale for many businesses to meet the proposed phosphorous limits.

Comment from Graham Burgess:

Industrial scale operations are happening on extremely sensitive sites at the headwaters of our chalk streams. Unless a zero impact on the ecology of chalk streams is implemented soon, then there will be problems. The industry needs to demonstrate a united and positive front, and to show that it is doing all that is possible to contribute to phosphorous reduction/eradication from chalk streams.

Comment from Mike Paigne (Watercress Association):

It is extremely unusual for the industry to be expected to produce zero emissions. It is not practical. Furthermore, if one industry should be made accountable for zero emissions, then all should be.

Question from Tim Nevard to all Panellists:

What are your views as to what the next steps are in this debate about phosphorous levels?

Response from Professor Gail Taylor:

It's a question of how we value the environment. I feel that aspirations of zero pollution are un-pragmatic. The industry needs to implement strategies in order to reduce phosphorous. However, the timescales given are too short, and this needs recognising.

Response from Trevor Bond (Environment Agency):

It's important that all interested parties work together to form a holistic view. The Environment Agency are under immense pressure to meet current legislation under the Water Framework Directive, and this is sometimes forgotten when focussing on the EA's involvement and/or participation in reducing phosphorus (setting limits, testing procedures etc.).

Response from Robin Chase (Atkins Global):

Statutory bodies have a mismatch between regulation and the subsequent enforcement thereof. Proper enforcement needs the consent from all interested parties. This is not happening. Without proper and consensual regulation, it will fall into disrepute, along with the watercress industry. Exact procedure for implementation of new regulation needs to be agreed between the parties and then rigorously enforced.

Response from Dr Pete Shaw:

Specific point sources of phosphorus need addressing on a larger and more detailed scale, in order to determine accountability. However, generic assessments of point source pollution will need to be ascertained.

Response from Graham Roberts:

Public participation is needed to increase awareness of phosphorus impacts on chalk streams. New relevant information is required constantly and it is the duty of regulators, industry and NGOs to do this.

Question from Tim Nevard to Graham Roberts:

The industry recognises that phosphorus levels are too high and need reducing. However, they say that they need time to adapt to and implement proposed changes. Would you be prepared to accept this?

Response:

It depends on the timescales required. The 3rd January is only a deadline for the industry to propose plans on what has been discussed so far, and for proposals to be submitted and/or addressed. If businesses require more time, then they should ask for this. What is important is that things do not get rushed through, and subsequently overlooked.

Question from Tim Nevard to Dr Steve Rothwell:

If you were granted more time, would the industry be able to meet the requirements proposed to reduce phosphorous?

Response:

Yes, absolutely. The industry accepts there is a need to reduce phosphorus. However, a clear, concise description of exactly what needs to be implemented needs to be outlined. A consultation period of approximately 3 months would be better (end of March 2014) in order to put a rational explanation/argument together in relation to problems and solutions associated with reducing phosphorus in chalk streams. But I accept the Upper Itchen is a special and urgent case.

Key points from the Forum

Tim Nevard summed-up the following key points from the day's proceedings:

- Phosphorus levels are unacceptably high within English chalk streams, and are contributing to radical changes in aquatic ecology.
- The proposed timescale for the watercress industry to implement changes in order to reduce phosphorus is pressing, but the issue is urgent.
- Current methodology for the testing of phosphorus is thought to be flawed by the industry and other parties. A change from specific concentration limits, to a mass balance approach should be considered.