



Dialogue Sessions: Flooding

Exploring the role of natural capital in flood risk management

SUMMARY REPORT

Meeting held on the 22 September 2014 at the British Library, London

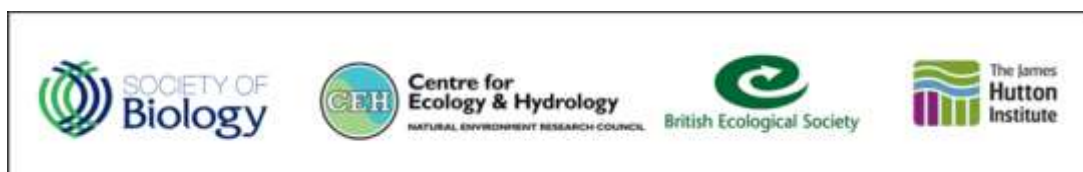
The Natural Capital Initiative (NCI)

NCI's mission is to support decision-making that results in the sustainable management of our natural capital based on sound science. We aim to do this by:

- initiating and facilitating dialogue between people from academia, policy, business and civil society who make or influence decisions to find shared solutions and approaches; and
- communicating independent, authoritative synthesis and evaluation of the scientific evidence base.

Our aim is to be the UK's leading forum through which decision-makers from academia, business, civil society and policy can engage in meaningful cross-disciplinary and cross-sectoral dialogue on how to embed natural capital thinking in policy and practice based on the best available evidence from across the natural and social sciences.

NCI is a partnership between the Society of Biology, British Ecological Society, the Centre for Ecology and Hydrology and the James Hutton Institute.



www.naturalcapitalinitiative.org.uk/

Acknowledgements

Many thanks to the meeting chair Professor Tim O'Riordan Emeritus Professor of Environmental Sciences at the University of East Anglia, and Dr Johanna Kieniewicz from the Science Team at the British Library for their help in this putting this meeting together. Thanks also to the speakers and participants of the meeting for sharing their insightful expertise.

Executive Summary

The NCI is in a unique position to facilitate the debate on catchment management to improve the management of flood risk and to understand the role of natural capital in widening this approach in the context of adapting to climate change. NCI brought together 30 expert researchers, practitioners and communicators to discuss the role of natural capital in flood risk management, in the first in a series of 'Dialogue Sessions'.

Meeting Chair: Professor Tim O'Riordan Emeritus Professor of Environmental Sciences at the University of East Anglia

Summary Points

- The landscape has changed, so that it is no longer 'natural' and intrinsic natural capital has been degraded as a result. Methods to help restore this natural capital can result positively overall on catchment management.
- 'Natural' flood defences may be useful according to scale, but are not a panacea. Nevertheless they can have considerable advantages for nature enhancement and enjoyment
- There are multiple benefits of a natural capital approach to flood risk management spanning wildlife, wetland creation, healthy and spiritual enjoyment of open space and economic enterprise.
- Working in an environmentally sensitive way can provide benefits for biodiversity, carbon management, tourism, recreation spiritual renewal and enterprise.
- The foundations are laid, but to affect cultural change we need to overcome compartmental and formal thinking and take an integrated approach to both policy and funding mechanisms.
- Engagement and empowerment of stakeholders (including land owners) to understand the process, and how their decisions create an impact, is critical for a successful project.

Key areas for further discussion

- A re-assessment of the points scoring scheme which guides the applicability of cost benefit analysis for flood management schemes should take into account the advantages of collateral investments in natural capital.
- Taking forward new approaches to comprehensive catchment care though new forms of financial catchment bonds, possibly based on the community interest company vehicle, with joint investment from private sector beneficiaries as well as public sector gainers.

- The value of comprehensive benefits arising for catchment care especially showing the opportunities for integration across catchment boundaries and administrative responsibilities so the catchment is the focus and not the administrative or political boundary.
- NCI taking a lead on new forms of conducting exploratory conversations within government departments local government offices and regulatory agencies (both environmental and commercial) to enhance common understanding over joint aims for catchment care.
- Discuss with the two regulatory agencies, Ofwat and Environment Agency the incorporation of both a resilience and a sustainability duty into catchment planning, management and financing



Envia

Dr Johanna Kieniewicz
Science Team
British Library

Envia is a new service being developed by the British Library to improve the discovery and access of environmental science information.

It is a free online resource, which collates and curates important 'grey literature' and disparate resources such as reports from government departments and agencies, PhD theses and data resources. It is designed to help researchers and practitioners find information, saving time and money.

Users are connected to full-text content, downloadable either directly from Envia or on an external websites.

The initial content focus for Envia is flooding related, and will be expanded to related subject areas in the future.

In April 2013, the Library began Beta testing Envia and they are looking for [your feedback](#).

www.envia.bl.uk

Speaker Presentations

Professor Mike Acreman Science Area Lead, Natural Capital Centre for Ecology & Hydrology

Mike Acreman presented evidence for an ecosystem approach to flood management, and introduced the technical aspects of this management at the catchment scale;

- The landscape has changed, so that it is no longer 'natural' and our natural capital has been degraded as a result; wetlands have been drained with 90% lost, 12% of forests have been removed from the UK, and 50% of our rivers have been modified. Methods to help restore this natural capital will impact positively on future catchment management.
- If we want to use a natural capital approach, we have to think at a catchment level.
- The landscape is fragmented, and there are different types of landscape with different hydrology within the catchment;
 - Woodland; The Pont Bren experiment showed an increase in infiltration and reduction in peak run off.
 - Flood plain storage results in a reduced peak flow.
 - Urban areas; storm runoff drains and roadside runoff traps can reduce flash flooding.
- There is a scale issue here in terms of how effective the natural capital approach can be; for small flood events at the local level, local level intervention using natural capital can be very effective, and has proven to be so on many occasions.
- Wetlands & forests can have significant impact at local level for reducing the distribution and timing of small floods.
- For larger flooding events, both in space and scale, there is a definite need for traditional engineering to complement the natural capital approach. During major and prolonged floods, the whole catchment is saturated; land cover type has little impact little impact.
- Environmentally sensitive flood management structure can provide multiple benefits; by-pass flood channels with high biodiversity, flood retention wetlands for recreation, dams with environmental flow releases. These can provide recreation, tourism and business opportunities.

Key message; there are multiple benefits of a natural capital approach to flood risk management. Working in an environmentally sensitive way can provide benefits for biodiversity, carbon management, tourism, recreation and enterprise.

Professor Edmund Penning-Rowse
Pro Vice Chancellor for Research
Middlesex University

Edmund Penning-Rowse gave a 'sceptics' point of view on how much the natural capital approach can achieve, versus other measures, in flood risk management;

- What seems to work in certain case studies, does not have general applicability, and cannot be replicated at the large scale for large flooding events.
- Antecedent conditions of catchment management appear to dominate as drivers of flood risk and losses, and cannot be influenced by 'natural' interventions.
- There is a history of work that's gone on in flood risk management; a natural approach may only help in small scale floods.
- Coastal flood risk is a major problem; there is very little that natural intervention can do here.
- Retrofitting (SUDS) likely to only help small flooding events in urban areas.
- There are large economies of scale in flood risk management; natural solutions are likely to be expensive.

Key message: 'Natural' flood defences may be useful, but are hardly a panacea (or anywhere near sufficient)

Katherine Pygott
Director of Water Management
Peter Brett Associates

Katherine Pygott explored how the concept of natural capital works at the policy level, and in infrastructure planning, flood risk and environmental management;

- There is a need for more integrated and sustainable infrastructure solutions
- The current approach to flood risk management needs to be adapted, to include the social and natural benefits that flood management measures can provide.
- Effective long term flood management solutions can only be found by fully understanding and valuing social and natural impacts and benefits.
- Policy is evolving, and the signs are positive. The overall Defra strategy is to incorporate the ecosystems approach within the way it carried out its business.
- This is very much the basis for the way forward, but it is difficult to stitch together previous approaches; this has resulted in missed opportunities, and progress is incremental.
- Infrastructure options, development and funding are often in silos
- There is a philosophy of 'engineering certainty' which isn't present in the natural capital approach due to the complexity of each catchment.
- To promote an infrastructure solution, there is a need for a cultural change across sectors, and partnership funding.
- Natural flood management is not a panacea, but where we have evidence for a solution, we need to be clever and deliver multiple objectives. We need to work with different partners and work from a broader palate.
- Lots of benefits arise from understanding what communities need, and there have been successful collaborative schemes, such as that from the Environment Agency and the Highways Agency.
- There is a role to educate politicians and decision makers, to evaluate the benefits of a multiple partner approach.
- Political will and cultural change are needed to facilitate a practical paradigm shift.

Key message; the foundations are laid, we have the evidence and we can build on these. To affect cultural change we need to overcome silo thinking and take an integrated approach. We need to widen and strengthen the toolbox that we have to work from.

Professor Carolyn Roberts
Senior Scientist
The Knowledge Transfer Network

Carolyn Roberts discussed collaboration and knowledge exchange between stakeholders, and what we can do to assist this process;

- The SUDS scheme had the potential to multiple benefits, but the communication of the scheme was based on the complexity of engineering, fear and expense and legislation. It resulted in unsightly, potentially dangerous SUDS, rather than innovative, attractive sites seen in other countries.
- In order to engage scientists and policy makers at the local level, social science is important, empowering people to understand the processes and decisions they need to make.
- To this end, three types of seminars were setup;
 - virtual seminars were set up through 'Second Life',
 - scenario-solving seminars were arranged, where participants can interact, socialise and draw on research, including case study related role play,
 - conventional tutor-led seminars.
- Pre-seminar surveys and observation helped to analyse the success of this approach. All groups showed an increase in perceived impact on knowledge following the seminars; significantly so for the role play and virtual seminars.
- Flooding is an example of a 'Wicked' problem; a complex issue with many actors, physical and social dimensions, overlapping spatial and temporal issues, and competing value systems.
- There is also the problem of ambiguous terminology and lack of clear, agreed solutions.
- This requires new ways of thinking; empowerment of the participants is key.

- There are several key influences on attitudes to learning and understanding, including prior knowledge, job role, economic aspects, personal characteristics, and the learning procedure.
- Learning procedures are reliant on a choice of content (including local examples), integration of expert and basic science and the credibility of various terminologies, as well as the quality of ICT systems.
- The role of 'leaders' as facilitators and the importance of face-to-face interaction is also a key component.
- There are important general lessons about communicating in this space;
 - Partnership working from the start is essential
 - Use of positive language; opportunity, not fear
 - Use Jargon free information
 - Defined terminology and methods are important
 - Ensure clarity about uncertainty and risk, including visualisations and animations to explain.

Key message; empowering people to understand the complex process and how to make decisions is critical for a successful project.

Alastair Driver
National Conservation Manager
Environment Agency

Alastair Driver gave examples for the EA flood risk management projects delivering multiple benefits through natural processes;

- We need to make the limited money available go further, maximising the benefits of flood risk management.
- Examples of good practice, and evidence of multiple benefits include;
 - Innovative flood storage area in Dagenham and South London provide biodiversity and social value
 - Agriculture is responsible for 75% of sediment in rivers; decreasing soil erosion in line with the Defra Soil Strategy for England can be aided through natural flood risk management, and save millions of pounds per year.
 - SUDS work; urbanisation without SUDS trebles the rate of run off during storm events. The SUDS for Schools example show how innovative SUDS can be incorporated to provide learning resources (gardens) and needn't be costly (e.g. through ditches and road humps).
- Holincote and Belford show how multiple small scale interventions have an impact on flooding events.
- We have evidence to show that small scale restoration schemes help to relieve small floods, give multiple benefits, and are significantly cheaper than engineering projects. If we get this right, restoration schemes will also deliver for the England biodiversity strategy.
- There is still some lack direction of what to do; we need to promote good practice, and warn against bad practice.
- Monitoring outcomes to improve practice is essential.
- Academics must share their research and evidence now (not when it's perfect) to ensure timely progress

Key message; we need a combination of small scale interventions in the right places. It is not reasonable to claim there is not enough evidence now; we should be looking at action, and how to get more and better evidence.

Ben Thorne
Senior Farm Conservation Advisor
FWAG South West

Ben Thorne discussed the Somerset Levels and Moors Flood Action Plan; and the farm level view of natural flood risk management and stakeholder engagement.

- Following the flooding of the Somerset Levels earlier in 2014, Somerset local government, along with Defra were challenged with delivering a 20 year action plan in six weeks.
- A range of work streams and lead organisations were involved, including the EA, district and council councils, and FWAG; FWAG were tasked with dealing with providing an integrated advice and support package on Land Management across the catchment.
- The project scope included reducing flow at the upper and mid-levels, and adaptation at the lower levels.
- Actions including capital grants for run-off attenuation, the development of a community land trust, and streamlining approvals process for work on minor watercourses
- The CAP also has a major role to play; maximising opportunities under NELMS, reviewing HLS Agreements and getting Defra to secure flood risk benefits from CAP funding.
- Land owners at particular problem areas were asked to change their land management; there are lots of drivers to change, but community pressure, social responsibility and peer pressure are major factors.
- A good evidence base is important to convince farmers to change their practice, and where situations are complex, continuity of advice and support is essential.
- Empowerment of the community is again key to getting buy-in. Understanding farming priorities and economics, as well as connecting farmers across the catchment is important.
- Funding is an issue; often the interventions are not as expensive as first thought. Local administrative grants are useful as they are quicker and less bureaucratic.

Key Message; Land management changes are difficult, but it is getting easier and is producing results. Engagement of land owners and developing a sense of problem ownership and solutions is critical.

Discussion

- We have created a problem for ourselves through mismanagement of the land, and we now need a different kind of thinking to find solutions.
- The Natural Capital approach is not a compromise- we are adding value by coordination.
- The Natural capital approach can bring social and economic advantages, enterprise and social opportunities, and health, benefits.

Policy

- A new, integrated approach to policy is needed;
 - This is about integrating the natural capital approach with other measures; how can we bring the two together to make a contribution that makes a difference.
 - Important decisions are made by DCLG and the Cabinet Office, as well as Defra and the Environment Agency.
 - Integration between different agencies has been a problem for a while. Is this intractable? Ofwat now has a resilience duty in the new Water Act, introduced in May 2014. Ofgem also has a sustainability duty. There is some common ground here, and scope to link up parts of government.
 - There important links to CAP as a land management tool and flood risk; we have the mechanisms and funding to influence land management at a massive scale, but there is resistance.
 - There are competing aims and objectives from Defra in farming, flood management etc. We need to align these aims, to get more 'bang for your buck'.
 - Planning queries involving a flood plain development go to the DCLG minister, rather than the Defra minister, as part of an in-built process. However the DCLG minister has an economic development brief, which dominates decisions; this decision process should be integrated across the two departments.
 - We need to identify where there are economic incentives leading to bad practice; there are counterproductive measures between projects, for instance for waste management, flood risk management and the water framework directive.
 - The Environment Agency Scorecard system should be reviewed, to allow for multiple benefits, assessing long term costs and benefits of different approaches.
 - There is a disconnection between government rhetoric on 'localism' and ultimate decisions by planning authorities, especially where government has a short term view, driven by corporate investors (e.g. supermarkets) and planners are under pressure to meet targets of decision timing even when the issues are detailed and complex.
- There are politically driven interventions (e.g. economic growth), and functionally driven interventions (e.g. flood risk reduction); these do not necessarily have to conflict, although they often do.
- There is a lack of understanding in media and government about what we actually do; we are recognised as some of the best flood risk managers in the world, but the message is not getting across.
- There is an obvious issue of leadership; what can we do in our professional areas about this?

- Local authorities are trying to get to grips with what they've been told to do. The Pitt Report is welcome, but it has created a new actor, with no expertise and few resources even though there is now a clear set of planning guidelines prepared by Peter Bide.
- At the coal face, i.e. the planning office decision, there is often a lack of expertise in engineering and/ or flood risk management, yet these people are asked to advise on a yes/ no decision. We are leaving planning decisions to people who will act on a political impetus, with little knowledge of catchment processes. How do we deliver advice to these decision makers?
- There is an opportunity in the HS2 development and the green belt to provide more strategic more housing, aligned with the garden cities movement, and including natural capital in these models. This would be a large scale approach but is still controversial.

Partnership & Funding

- The multiple benefits of the natural approach should be linked back to multiple sources of funding. Partnership is the key. We must share in development of multiple objectives; using what drives people (be that health, biodiversity, social space etc.) There are too many organisations in this space – which makes the process of partnership more difficult.
- We need to turn the argument around in terms of funding, since other arguments sell better. We should focus on wider local improvements and regeneration, to get funding from sources outside of EA and Defra flood management pot. Communities should focus on their own specific issues and be incentivised to do something about them.
- Catchment bonds are one such idea; investment resource based on community capital, allowing large groups of people to put money in to reap multiple benefits.
- Co-ordination of the funding available for flood risk management is needed – no one is filtering it at the catchment scale.
- Synergy of projects and funding across EA and Defra is needed.
- We have a dedicated budget for flood risk environment – if an integrated approach means that all the money is put into one pot; this is a risk.
- Funding should be sourced privately, not from a levy or from the tax payer.
- We need new, innovative forms of funding. Corporates are interested, but it needs to be part of a larger package.
- Payment for Ecosystem Services is one way of funding the provision of services that have multiple outputs, but this needs more scrutiny.

Communication

- Nature is not a backdrop; we need to reconnect with nature as human species. The social and recreational benefits that a natural approach to flood management can bring are significant.
- People need to be appropriately prepared for flooding – this is very difficult, since memories are short.
- Interconnected flood forums (like the Knowledge Transfer Networks) can provide a new community base for communication and vision.

- Are we making enough of existing catchment partnerships that now exist? Could we put more resource into this?
- At the interface with corporate funding for water management solutions, a good narrative is always needed. There is a lot of consensus in the room, but we need to have the right pitch- the right story to tell; what do we actually want to happen? There will be differences at the local level, but there are general messages – these will be needed to get funding.
- We must overcome ‘silo-thinking’ and improve communications between sectors.
- Political will is vital; there are lots of different mechanisms to make things happen, but they won’t happen until there is political understanding and will.
- Public awareness is an issue. Some flooding will be inevitable. We have a responsibility to work with the media and politicians to get message across to the public (voters).

Practice

- There is a question over economies of scale; flood catchment management has to be large scale, but this doesn’t mean that the interventions need to be big or expensive.
- We should use existing good projects, eg. Belford and Holnicote, where local landowners are on board, and replicate that model many times over. This is small scale and bottom up; one key way to getting buy in.
- We are allowing rivers to reduce capacity; there is an urgent need to change this policy.
- Compacted turf on farmland is a problem, but the land is not always fully saturated; once the surface turf is broken, there is access to soil storage.
- We need to instil a more natural approach to maintenance which looks at larger benefits for both the catchment and communities.
- Water companies are now allowed to invest in upstream water management. This is more for water quality measures, but could also help the flooding agenda
- In Hull in the 2007 floods, water companies had a major role in water management in the city, and to this day, they have still not found a solution here; perhaps due to lack of political will?
- Often those who hold the solution don’t have the problem (i.e. upstream land owners), but there are ways of combining projects to get a solution. (for example, using innovative road construction). We need to develop this as a local issue – it isn’t always, especially in urban areas. We have a better chance of doing this if we combine multiple benefits; social, economic, carbon storage, health benefits etc.

Research

- Monitoring and data sets need to be collected and joined up.
- Research tends to be quite narrow, but flooding is a broad system, incorporating farming systems etc.
- Innovative technologies are needed, and there is opportunity to work with academics in this space.

Resources

Planning Advice for Integrated Water Management;

The University of Cambridge Institute for Sustainability Leadership, with support from industry, Defra and the Environment Agency, and the TCPA, CIWEM and CIRIA, have produced planning advice for integrated water management. This Advice Note provides a one-stop-shop to de-mystify water management and demonstrate the benefits of building it into plans and planning decisions. It shows planners how to turn the challenges of managing water into opportunities, to provide the new homes and infrastructure that communities need at lower financial, environmental and social cost.

<http://www.ciwem.org/policy-and-international/current-topics/water-management/planning-advice-for-integrated-water-management.aspx>

Working with natural processes to reduce flood risk. R&D framework: initiation report

Environment Agency Report.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/338437/SC130004_R2.pdf

Feedback

'I just wanted to reiterate what a good session it was... the dialogue brought the subject together in a very useful and powerful way - and set the challenges of how it can be delivered'

'It was a good meeting with well-focussed hits for NCI to follow up'

*'It was a very interesting and stimulating afternoon and useful already in meetings I have had
Excellent meeting and lovely venue'*

'Many thanks for inviting me to the event, it was very interesting to hear the discussions in the room and think about how we can feed into those topics in the longer term'