

Achieving multiple benefits through sustainable catchment management

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“Because of changing weather patterns, flood risk in floodplains can no longer be effectively managed by structural defences alone”. Draft Parliamentary Office of Science and Technology Post Note 2014 on Managing Floodplains.

I will use examples of projects which deliver flood risk benefits to help illustrate a range of evidence that is out there already using “Killer Facts” gleaned from dozens of reports and journals

In so doing I hope to show the value of having measured evidence which is transferable to other similar projects.

Important to note that all of these solutions automatically deliver for biodiversity. If we get this right wildlife will follow and we will move closer to achieving the stretching EBS targets.

Hope this quick journey down the catchment from source to sea will set the scene for the more detailed presentations to come

Multiple Benefits

➤ Through upland restoration



Operation Peatland, Forest of Bowland



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- **KILLER FACT** from Making Space for Water project – Peak District NP: restoration of bare and gullied peat reduced peak flows by 30% and increased lag times by 20 mins thus contributing to the reduction of downstream flood risk.
- Re-wetting the Exmoor Mires by blocking drainage ditches has increased the water storage capacity of a 46 ha micro catchment by 2000-6000 cubic metres.
- Drain-blocking in the upland blanket bog of the Berwyn and South Clwyd mountains led to stream flows during drought periods becoming more stable and up to 3x higher than prior to blocking.
- In addition: a 2013 Defra-commissioned report on “*Developing place-based approaches for payments for ecosystems services*” estimated that around 36,000 tonnes of carbon dioxide equivalent (CO₂e) per year could be sequestered or safeguarded if all 30,000 ha of blanket bog in the South Pennines were managed to improve carbon storage and sequestration.

Multiple Benefits

🔧 Through pond creation



Belford Burn, Northumberland



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- Sediment traps (like the one shown here) on the Netherton Burn in Northumberland, reduced the sediment load in a flood storage area further downstream by 57%, the total phosphorus by 45% and nitrate by 27%. Periodic excavation of these ponds enables farmers to return this organically rich silt to their land

Multiple Benefits

👉 Through woodland planting



Woodland planting on the Belford Burn



Woodland shelterbelt at Pont Bren



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- A study on the R.Frome in Dorset showed that woodland contributes less than 5% of the fine sediments to the river compared with pasture (app 25%) and arable (app. 65%)
- Shading provided by trees in the New Forest reduces water temperatures by up to 5.5 degrees C on hot summer days, compared to open grassland sections, preventing it from rising above the lethal limit for Brown Trout.

Multiple Benefits

➤ Through woody debris



Woody debris installed in Belford Burn



Leaving woody debris in situ at Holnicote



Woody debris combined with floodplain attenuation at NT Holnicote, Somerset



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- **Holnicote multiple small-scale interventions:** by holding water in strategic locations so that it was released slowly after intense and prolonged periods of rain in 2013/14, flooding was prevented in the nearby villages of Allerford and Bossington
- **Woody debris restored to the R. Blackwater at Hawley,** showed marked increase in BMWP invertebrate score and in dissolved oxygen compared with control reach (Queen Mary Univ of London study)

Multiple Benefits

➤ Through rural wetland creation



Lunt Meadows, North Merseyside



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- **National Ecosystem Assessment** estimated the value of wetlands to society = £1200 per ha per year
- **Lunt Meadows** is 87 ha = app £100,000 p.a. value to society using above figs

Multiple Benefits

🔗 Through flood storage area enhancement



Flood storage area of very limited biodiversity value



R. Beam Parklands, Dagenham



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The award-winning Beam Parklands Project centred on the Dagenham Washlands in the East end of London, is a great example of what can be done to enhance flood storage areas.

The flood storage area itself protects 400 homes, the Ford Works and Barking Power station which supplies a third of London's electricity.

This project has delivered 53 hectares of green space with a mosaic of habitats and improved flood storage, providing multi-functional benefits to the local communities and businesses.

Multiple Benefits

➤ Through urban river restoration



Restoration of the
R. Medlock at
Clayton Vale LNR,
Manchester



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- 90% of visitors to the greenspace alongside the restored Skerne in Darlington were quite or very satisfied with the restoration of the river 15 years on from the completion of the work
- Physical inactivity is a major preventable health risk which affects about 60% of the population and costs the UK app. £1Bn a year in direct treatment costs and many times that in overall costs.

Multiple Benefits

📌 Through urban flood risk management



River Quaggy at Sutcliffe Park, South London,
before and after flood alleviation work



KILLER FACT from the Mddx Univ Socio-economic study of the R. Quaggy: The average amount of time spent per person in Sutcliffe Park increased by 44% after “daylighting” of the river.

- This scheme created 85,000 cubic metres of flood storage and significantly reduced the risk of flooding to 600 properties
- Quaggy @ Sutcliffe Park: 2003 - a “daylighted” river with associated wetlands – now an LNR
- **KILLER FACT** from the Mddx Univ Socio-economic study of the R. Quaggy: The average amount of time spent per person in Sutcliffe Park increased by 44% after “daylighting” of the river. In addition to spending more time in the park per visit, people visited more often and walked from further afield to visit the park.
- Properties adjacent to parks like this in London cost an extra a 5-7%
- In this photo there are app 700 properties within easy walking distance of the park and the average price for these streets is currently £350K. 7% thus equates to £17M of property value.

Multiple benefits

➤ Through SUDS



Green roof, London



Surface water collection pond, Dunfermline



SUDS for Schools project, Queen Elizabeth Girls' School,
Pymmes Brook catchment, North London



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- **KILLER FACT** from Environment Agency Introduction to SUDS: On average, urbanisation without SUDS trebles the rate of run-off during storm events
- Overall the maintenance costs associated with the Lamb Drove SUDS at Cambourne in Cambs were 4% lower when compared to costs associated with an equivalent conventional pipe drainage systems.
- Need more evidence of water quality and flood attenuation benefits of SUDS – it must be out there?

Multiple Benefits

➤ Through coastal realignment



Steart managed realignment project, Somerset



KILLER FACT from EA Ecosystem Services Case Studies report: 400 ha Alkborough Flats managed realignment scheme cost app. £10M and provided £12M of storm protection to land and property. Other ecosystems services benefits = app. £1M p.a.

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Steart project - a large coastal flood risk management scheme just completed:

- Reduces the flood risk to 85 local properties
- Helps to reduce impacts of sea level rise throughout Severn estuary and provides statutorily required compensatory intertidal habitat thus enabling hard defences to be maintained elsewhere
- Creates 8 km of new footpath, bridleway and cycle path
- Creates 8 observation points with two bird hides and two more planned
- Improves water quality in the estuary by feeding local catchment water through wetlands
- Provides important nursery area for commercial fish species including Sea Bass
- Provides opportunities for extensive traditional breed grazing including development of saltmarsh lamb and beef enterprises
- Creates hugely valuable habitat for wetland birds. Even during construction, Steart was already attracting large numbers of wetland birds: eg in winter 12/13 1300 Shelduck, 500 Teal, 1000 Golden Plover, 4500 Lapwing, 1200 Dunlin

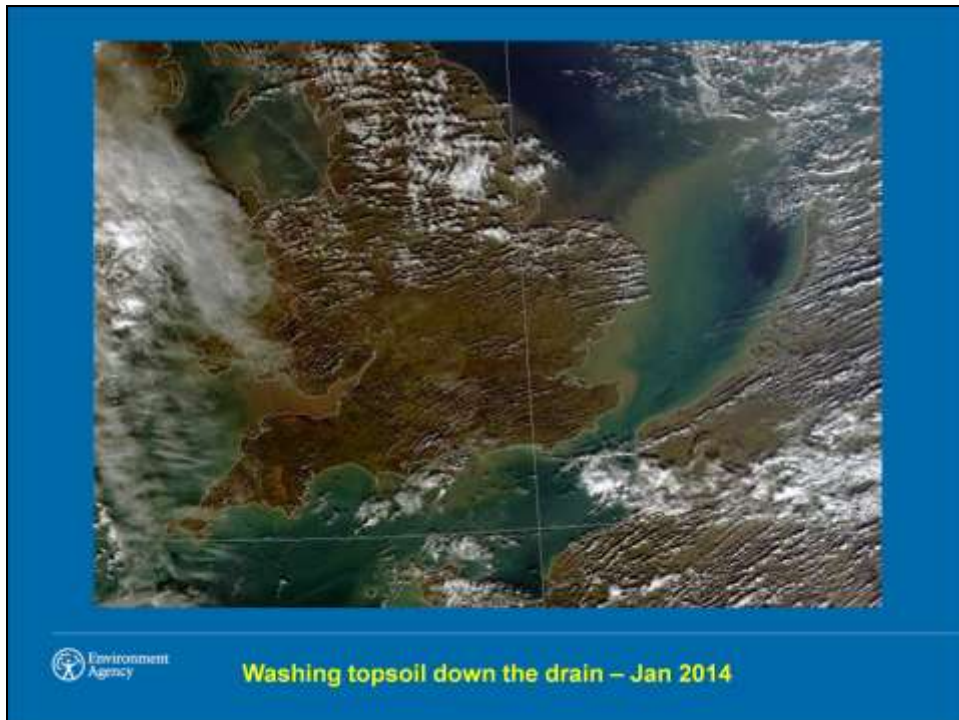
Multiple Benefits

➤ Through soil management



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- 2.2 million tonnes of silt – ie topsoil - is lost from the land each year in the UK
- The total cost to society of trying to remove it from rivers and lakes is app. £45M – mainly due to the actual cost to farmers, water quality treatment costs and dredging costs.
- The actual cost of purchasing 2.2 million tonnes of topsoil is app £40M if bought by the tonne!



•In conclusion:

•It is no longer reasonable to claim there is not enough evidence to show that these solutions contribute to flood risk management whilst delivering other significant benefits.

•However we do need more and better evidence to refine our decision-making on the best mix of solutions to apply in any given situation.

•It is essential that we continue to monitor the excellent projects that are out there – several of which we will hear about today and ensure that the knowledge we gain from them is rapidly and extensively disseminated.

•This is not the time to be seeking perfection from the evidence - we must combine commonsense and pragmatism with the best available information and crack on with engendering a step-change in the application of these natural flood management solutions. I commend CIWEM for convening this conference and I hope that it will motivate all present to do just that.