Investigation into the Ecological Success of River Enhancement Schemes at Petty's Brook, Norman's Park and Penton Hook

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A bit about me

- Graduated in 2000 from Reading University with a degree in Physical Geography

- Graduated in 2001 from Kings College London with a masters degree in Aquatic Resource Management.

- 2001 completed a placement with ecology team at the Environment Agency – MSc project

- Joined Defra, in 2001 for 12 months to complete a synoptic review of evidence of diffuse water pollution from agriculture

- Joined Environment Agency in 2002. 10 years on still here….

My project – Introduction

⮕ **Post project appraisal on 3 enhancement schemes:**

⮕ Petty's Brook – removal concrete channel

⮕ Norman's Park – channel creation

⮕ Penton Hook – bypass channel

⮕ **To determine the success of each scheme a comparisons was made against:**

⮕ Biological objectives

⮕ Predicted fully recovered macrophytes assemblages

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My project – Method

→ Invertebrate sampling

→ Calculated <u>biotic</u> & <u>diversity</u> indices

→ Used EA's RIVPACs (River InVertebrate Predictions A Classification System)

→ Multivariate Analysis.

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Results – Petty's Brook

➔ Mixed results

➔ The new channel was designed with varying gradients to encourage development of different riverine environments.

➔ This impacted on the rate at which in-stream macrophytes grow at difference locations and consequence the level of invertebrate colonisation.

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Results – Norman's Park

➔ Disappointing post monitoring results:
- Low biotic score and
- Reduced biological quality

➔ Why:
- Washing out
- Lack of shelter
- Community disturbance

➔ Measures to improve success:
- Fencing
- In-stream planting

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Results - Penton Hook

- Considerable post-scheme monitoring

- Slight decrease in BMWP

- Cluster analysis showed that communities were developing at similar rate along the channel.

- Considered to be the most successful of all the schemes

- Met all its biological objectives

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My project – Conclusions - Schemes

- Penton Hook enhancement can be concluded as a success. But has had to longest time to develop.

- Petty's Brook was showing encouraging signs at downstream sections.

- Norman's Park gave to worst reflection of enhancements. Causes determined and solutions identified.

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My project – Conclusions – In general

- → <u>Long term sustainability and success</u> of restoration projects is reliant on them being integrated.

- → <u>A full understanding</u> is required of all in-river processes and ecosystem components and their interaction with one another.

- → <u>A full understanding</u> of factors influencing re-colonisation which can be factored into the design.

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My project – Recommendations

➔ <u>Post-scheme monitoring</u> is essential and is often over looked.

➔ <u>Quantify the wider benefits</u> - public perception in addition to determining the ecological success.

➔ <u>Integrate into catchment plans</u>

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Opportunities

➔ Learn more about the Environmental Agency; what it is, what it does.

➔ My dissertation project didn't lead ultimately to a role, but it gave me valuable business and relevant experience to help secure my first job at Defra.

➔ My dissertation supervisor at the EA, took pressure off my academic supervisor at university.

➔ Post-scheme monitoring and detailed data analysis is not something that can always be justified. So dissertation projects are often essential to ensure this important work is done. And should be built into project designs.

➔ Whilst working at Defra, because of my experience at the EA, I supervised 2 students from the MSc.

Any Questions ?