



RIPARIAN WOODLANDS AND RIVER HABITAT CONSERVATION

THE POTENTIAL FOR PROTECTIVE TREE COVER IN IRELAND

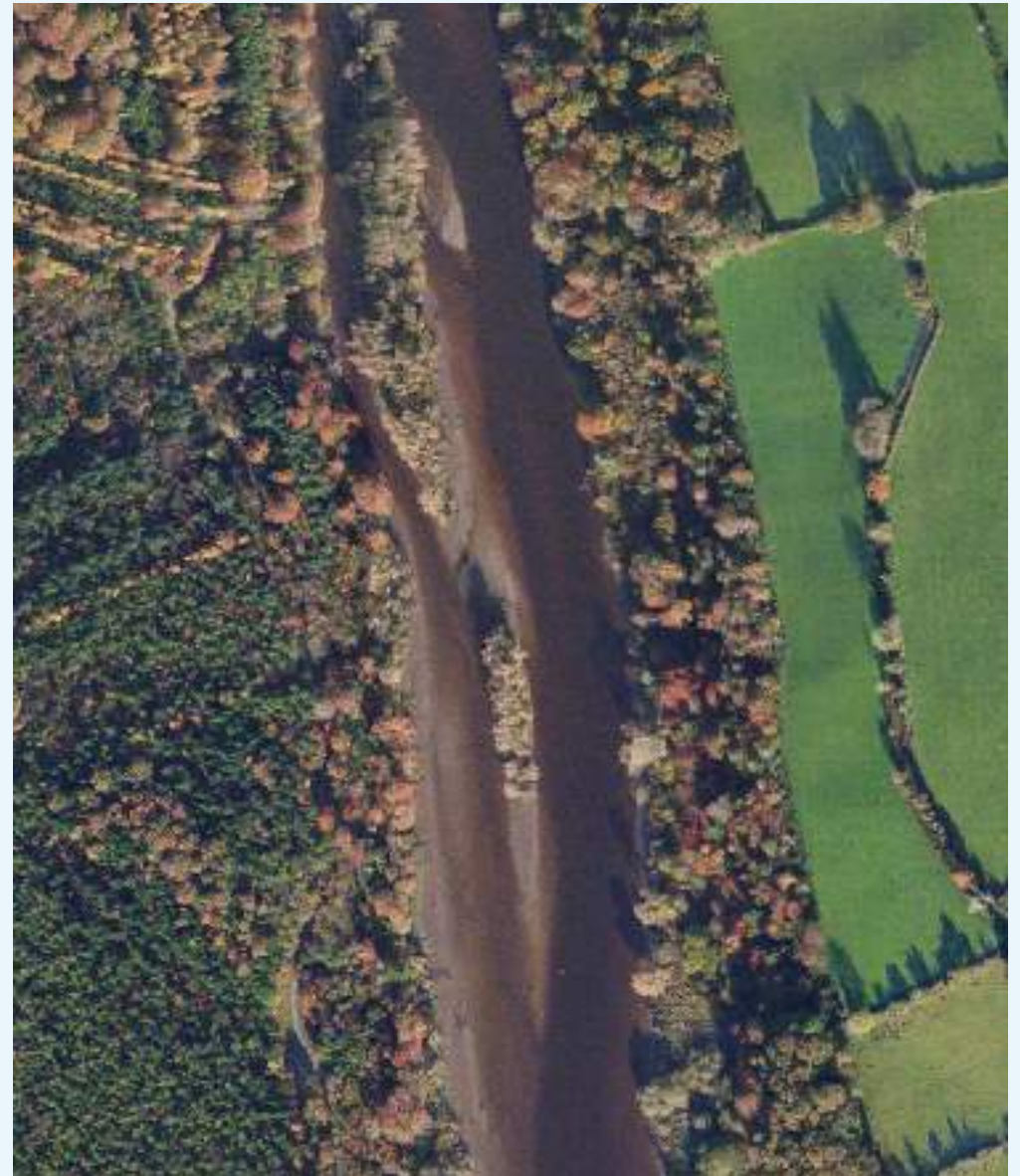
DECLAN COOKE



Iascach Intire Éireann
Inland Fisheries Ireland

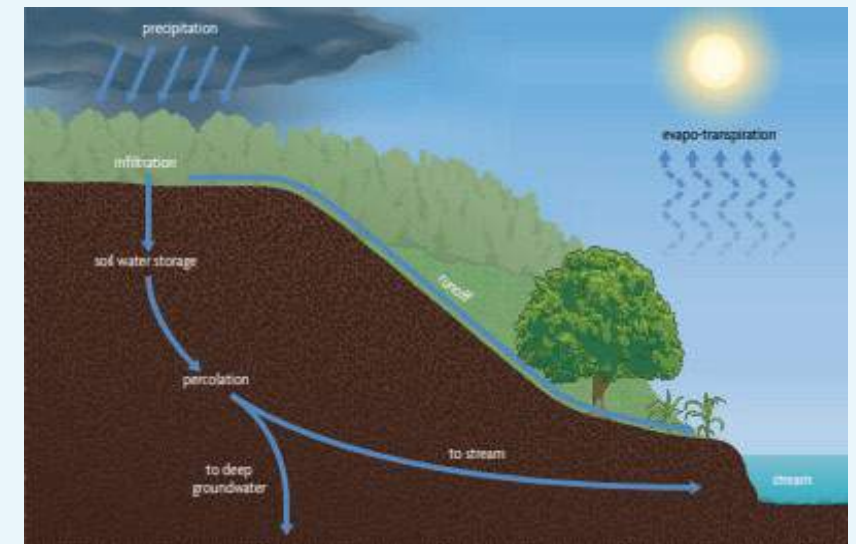
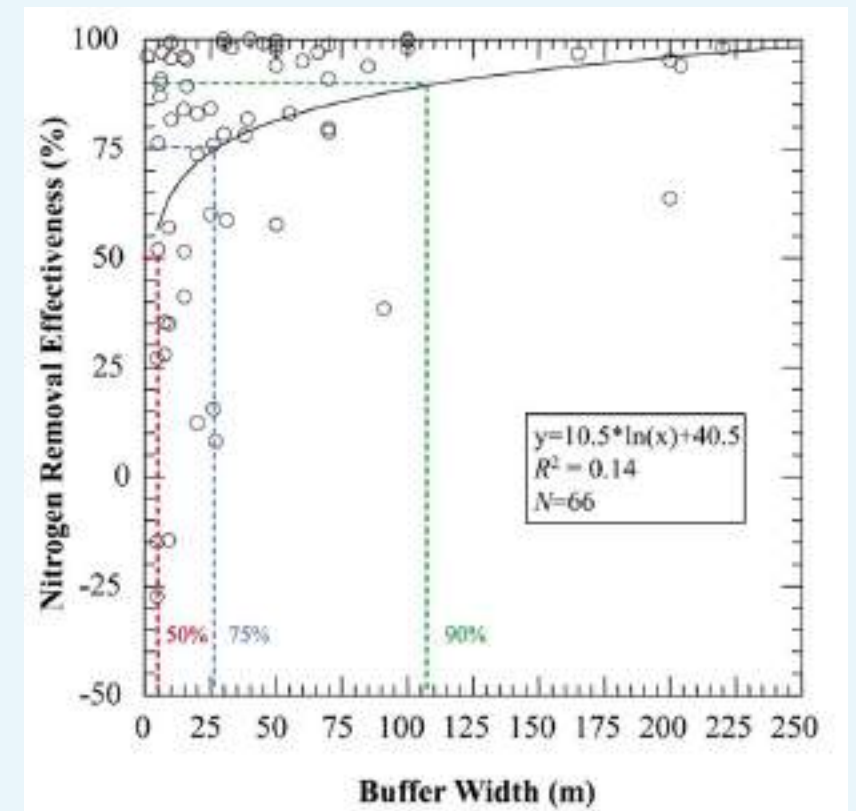
ECOSYSTEM SERVICES PROVIDED BY RIPARIAN WOODLANDS

- Interception of Nutrients and Sediment
- Leaf Litter – Protection of Aquatic Food Chains
- Control of Light & Photosynthesis
- Temperature Regulation
- Mitigation of Floods
- Enhancement of Habitat Structure for Fish

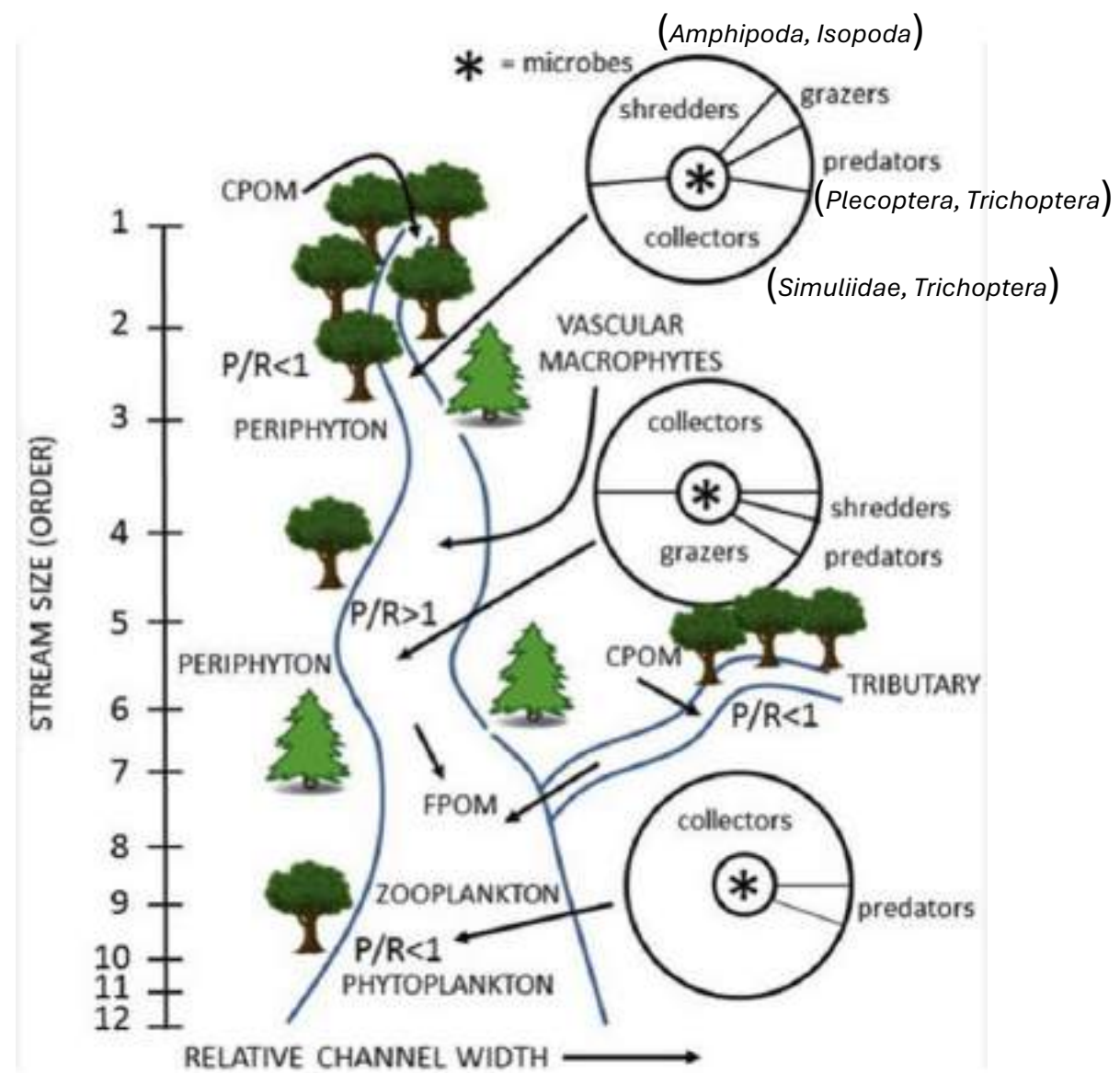


NUTRIENTS

- Most of PO_4^- (>90%) can be absorbed with a 5m buffer
- Nitrogen interception depends on soil infiltration
- Sediment Interception depends on ground cover & Structure



LEAF LITTER AND NUTRIENT SPIRALLING



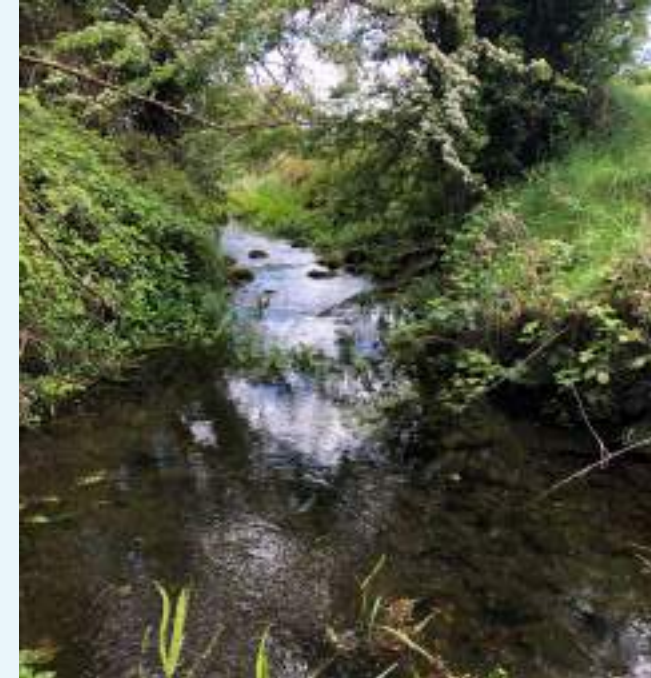
Lotic Ecosystems



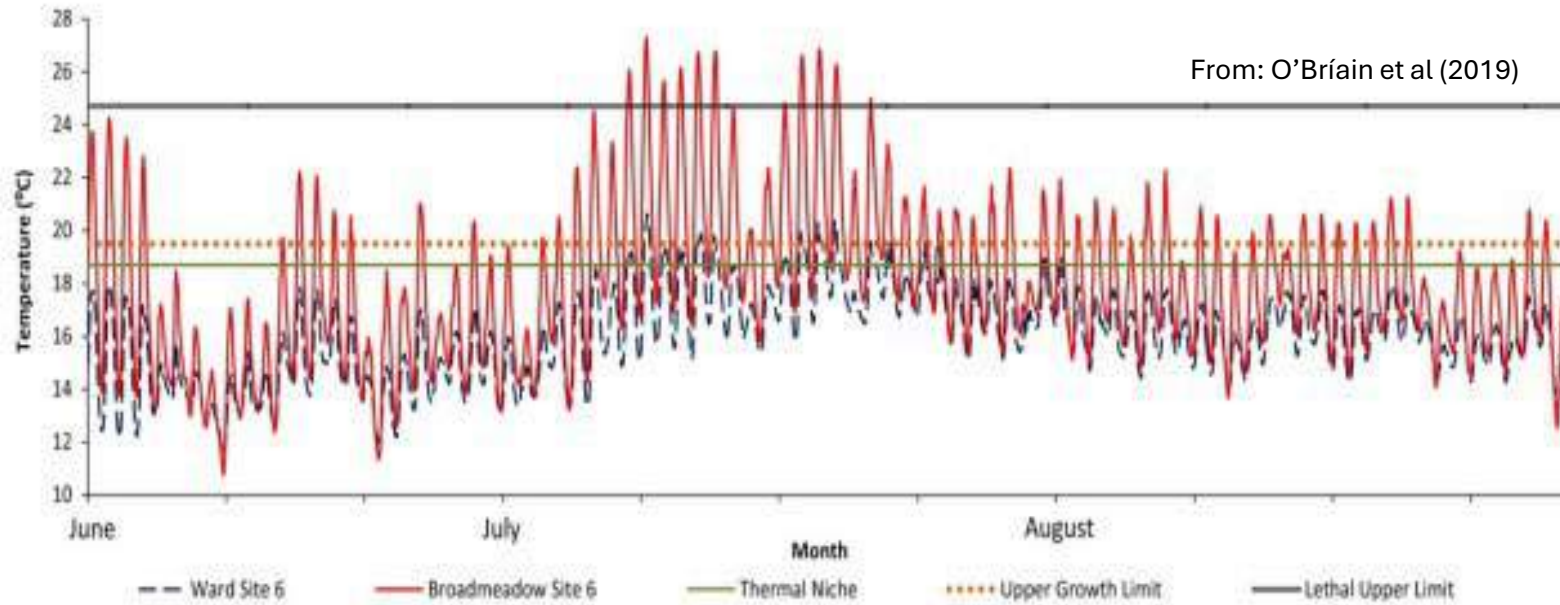
REGULATION OF LIGHT & PHOTOSYNTHESIS

Excessive Incidental Light:

- Promotes profuse monocultures of emergent vegetation
- Reduces available habitat for Some fish Spp.
- Light Mosaics provide conditions for more diverse flora

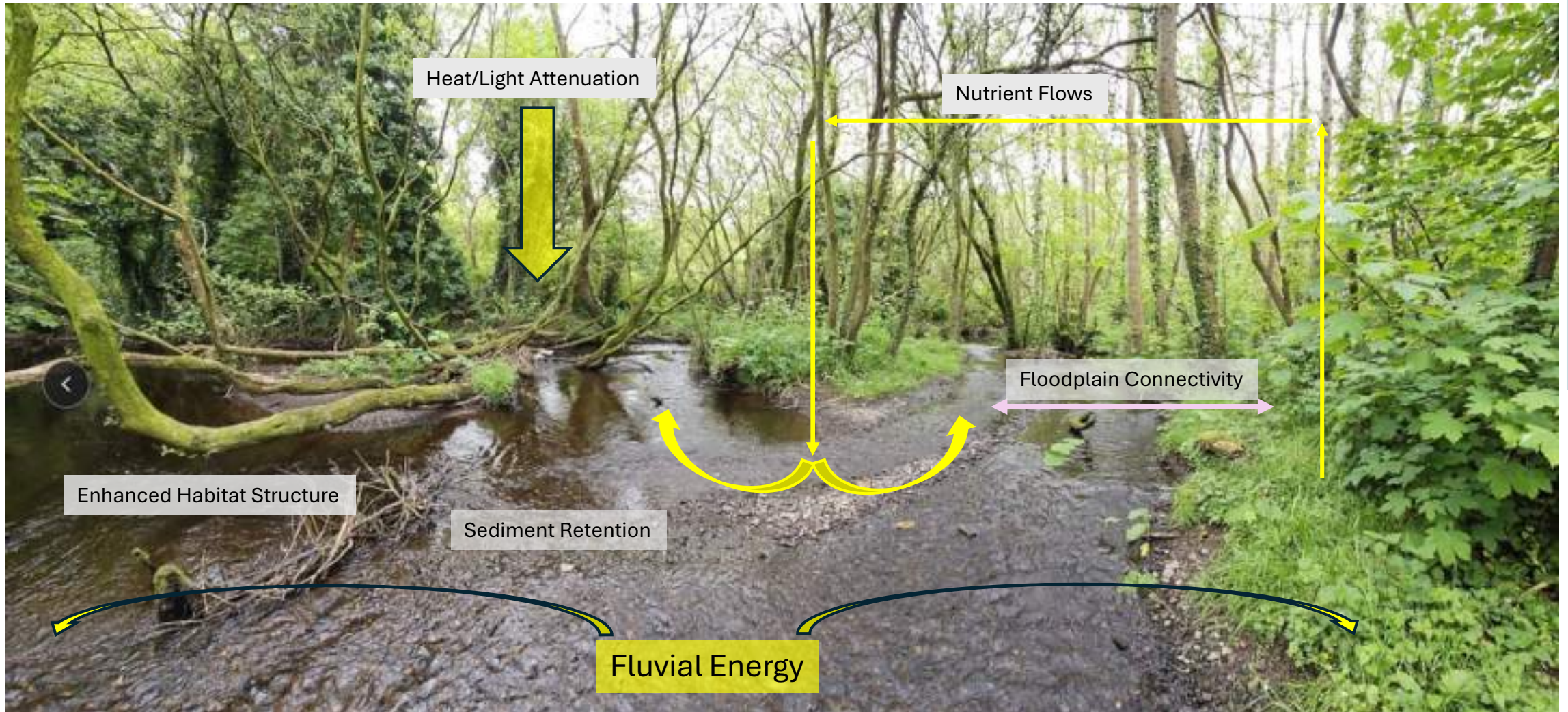


TEMPERATURE MITIGATION



- IFI - Preliminary Catchment Risk Models
- Tree Cover Accounted for $>8^{\circ}\text{C}$ in River Temp Difference

- A contemporary Protective Forest – Landscape Evolution in the 21st Century

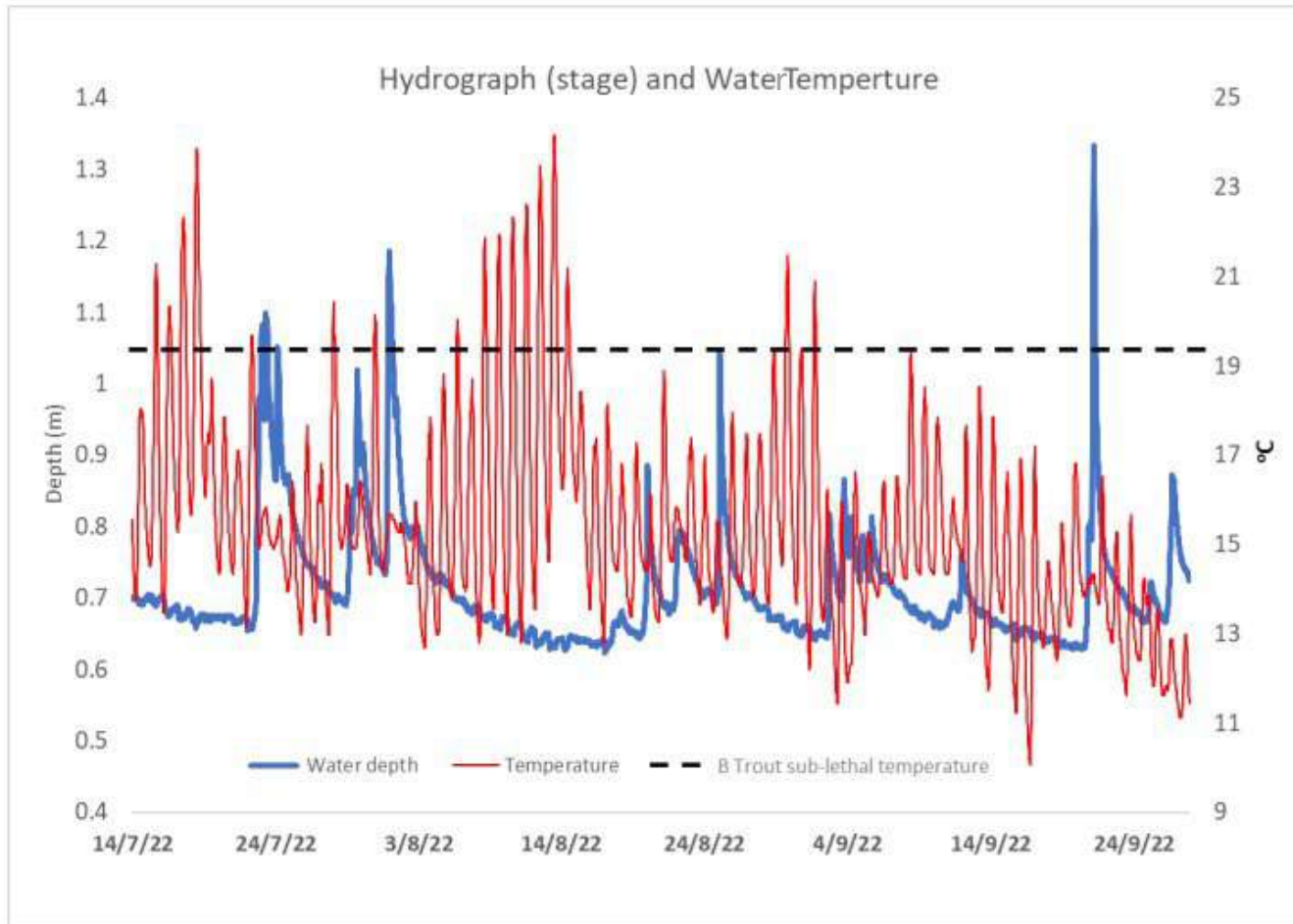


- Geographical Context



Climate Mitigation and Building Resilience In a Salmonid Catchment

Low flow/high temperature conditions



The Bealnabrack River



CATCHMENT CHARACTERISTICS

- THIN SOILS WITH POOR VEGETATIVE COVER
- STEEP SLOPES
- HIGH RAINFALL
- HIGHLY ERODIBLE SEDIMENTS
- MOBILE BEDLOAD
- EXPOSURE TO HEAT

Key Pressures: Land Use

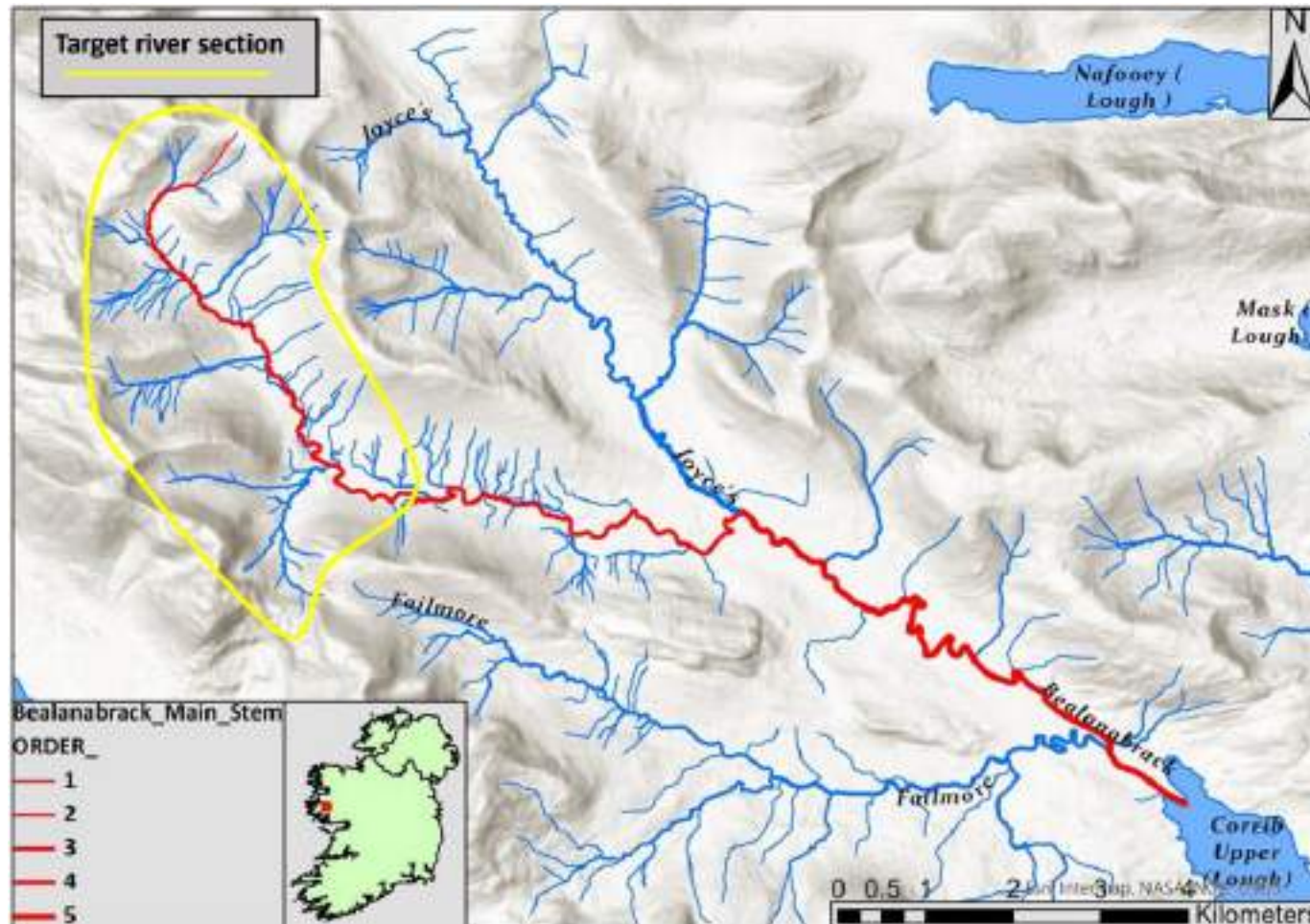
- Legacy Forestry – land drainage
- Overgrazing

IFI'S CATCHMENT SCALE
PROJECT(S)



Key Advantage: Land Ownership - Space

THE BEALNABRACK RIVER



- Measurable Effects from Woodland Establishment
- Hydrograph Change
- Sediment Movement
- Fish Stocks
- Biodiversity Metrics

Restoring Hydromorphology (Upslope/Riparian)



NATURAL FLOOD MITIGATION



Image by: Woodland Trust

- Leaky Dams
- Soft Engineering
- Retaining water in catchments



Restoring Hydromorphology (Instream)



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WOOD IN RIVERS – ENHANCING FISH HABITAT STRUCTURE

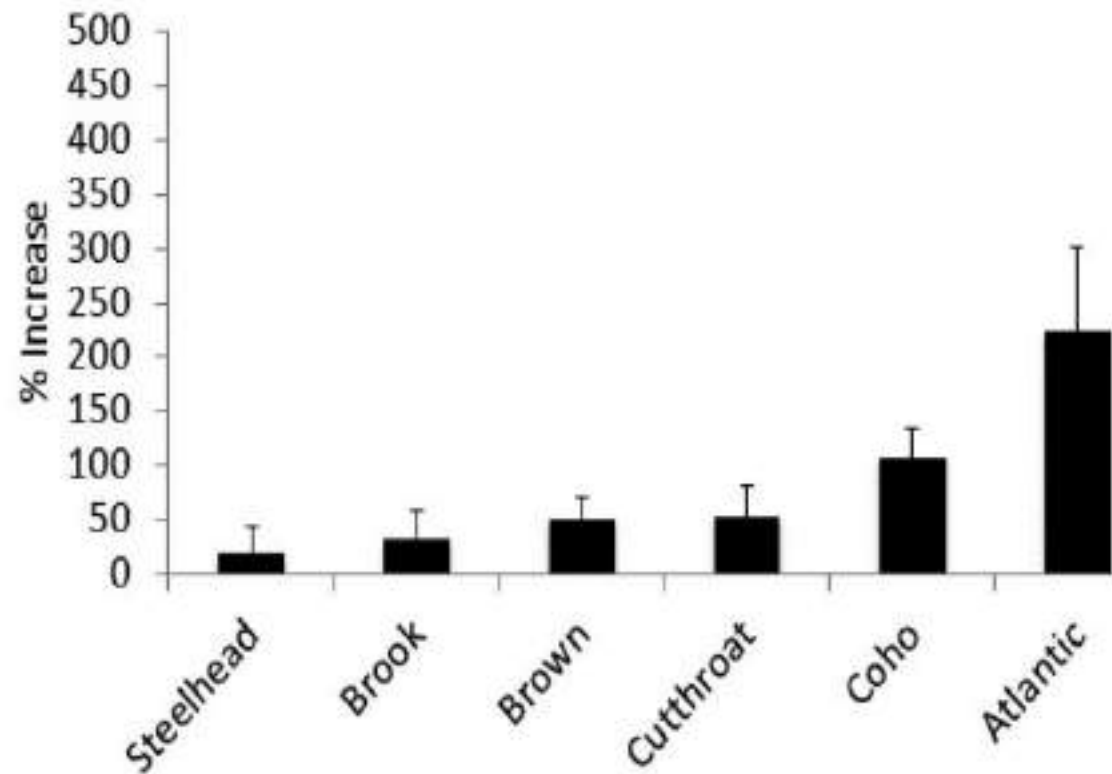


Figure 9. Response of various salmonid species to habitat improvement projects (n=211) that emphasised wood placement (Whiteway et al. 2010). Response is in percent increase, and error bars represent 95% confidence intervals.

Future Projects for Protective Forests



Shramore



Owenglinn



Dowros

SUMMARY

Native Woodlands Provide Multiple Benefits to River Ecosystems

They provide a clear protective function in terms of :

- Nutrient and Sediment Run-off
- Light attenuation
- Temperature Amelioration
- Natural Flood Mitigation
- Building Climate Resilience in River Ecosystems
- Improving Habitat Structure for Fish and other Species

IFISH

**Fish and Habitats:
Science and Management**

Vol. 2

River Restoration Works –
Science based Guidance
centred on Hydromorphological
Principles in an Era of Climate Change



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