

# Barriers to Progress- migration issues for sediment and species in Irish rivers

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Inland Fisheries Ireland



# Inland Fisheries Ireland

- Inland Fisheries Ireland (IFI) is the state agency responsible for the protection, management and conservation of Ireland's inland fisheries and sea angling resources.
- Fisheries resource =  $\Sigma(\text{species} + \text{habitats})$



# EU Water Framework Directive (WFD)

- Water 'Quality' assessed via a series of Quality Elements
- Fish as a Quality Element
- Hydromorphology as a support
- Hydromorphology is fundamental to fish – it **creates** the habitat!



# Hydromorphology in WFD

## 3 key parts in rivers

- Hydrology – quantity and dynamics of flow
- Morphology – instream and riparian condition
- River continuity

# Hydrology

- drought conditions – flood conditions



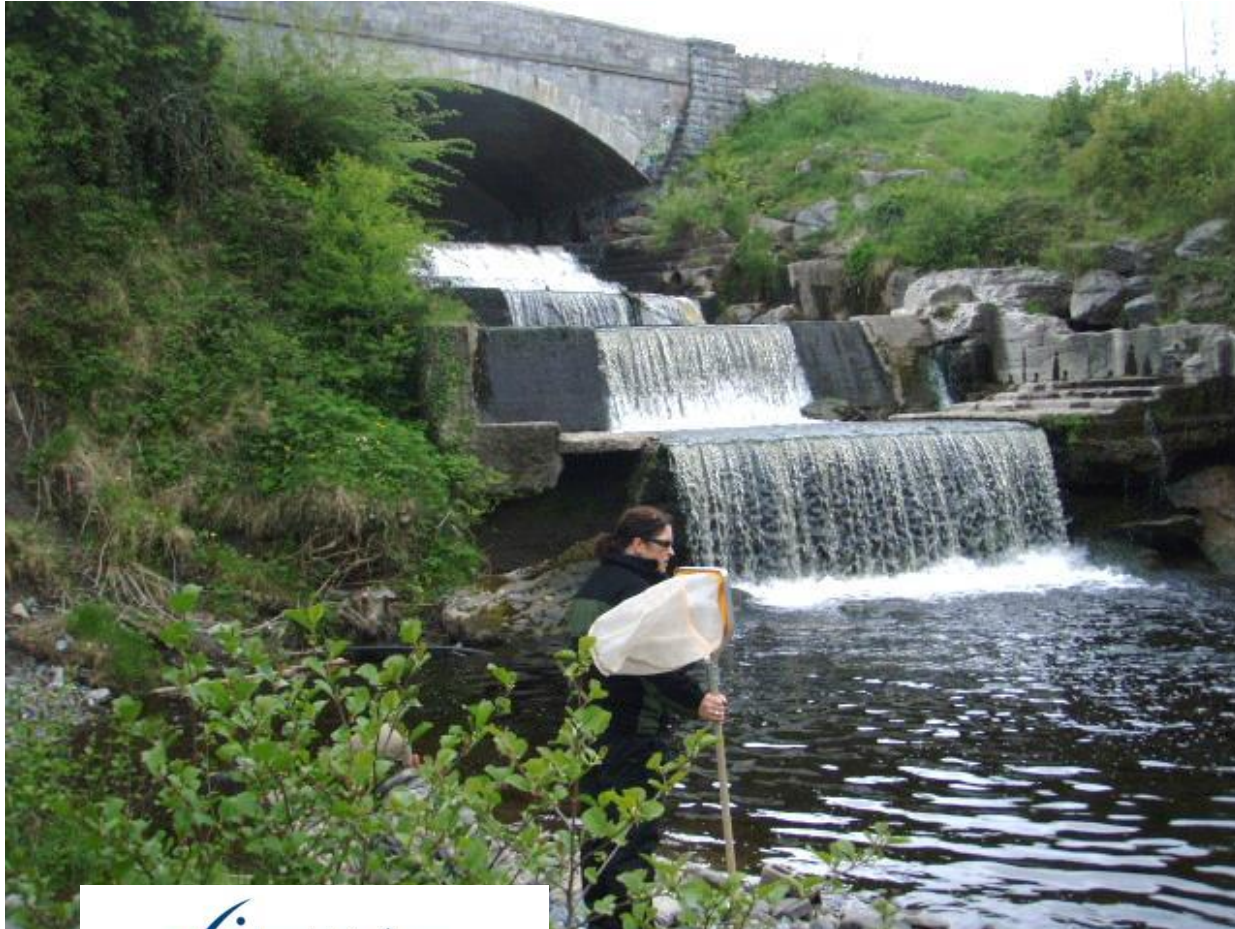
# Morphology - instream



# Morphology - riparian



# River Continuity



**WFD: “*The continuity of the river is not disturbed ..... allows undisturbed migration of aquatic organisms and sediment transport*”**


# Hydromorphology

- potential/actual impacts

....where does it crop up???

Fine sediment  
runoff  
= sediment  
loading



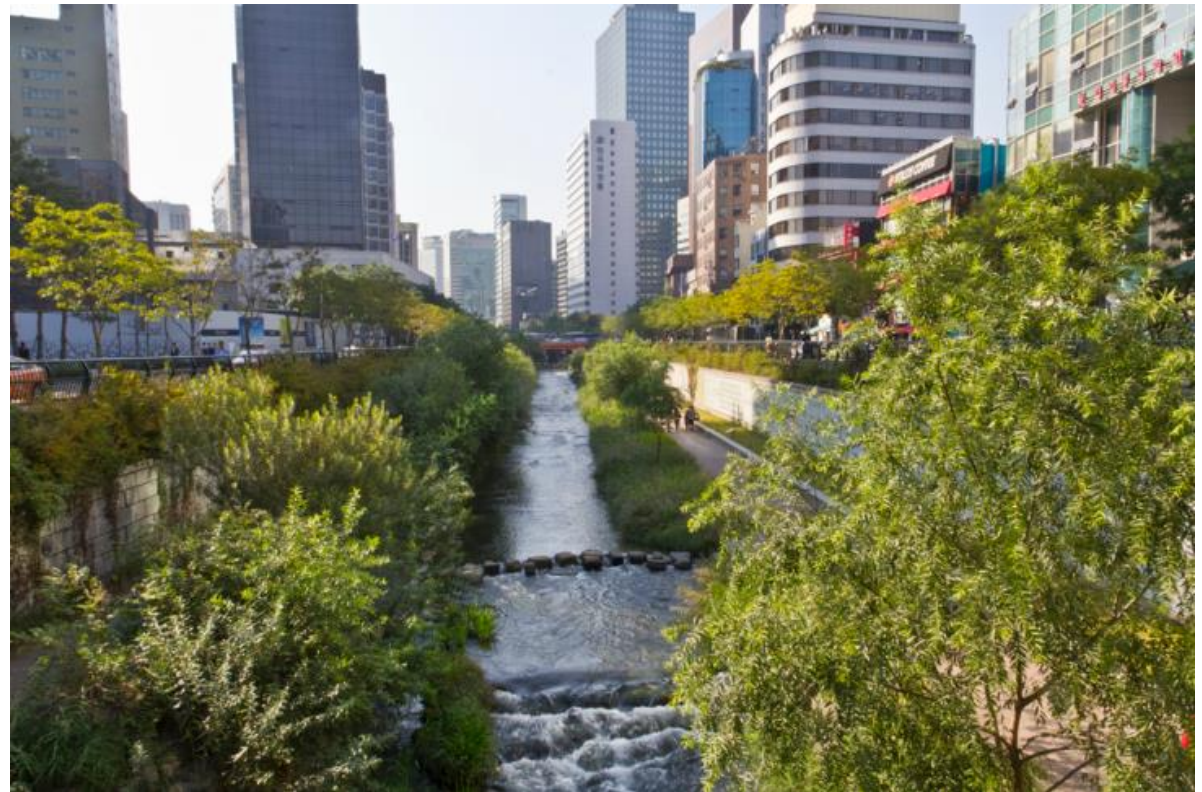
 Agricultural runoff can carry sediment, nutrients and pesticides to surface waters.  
USDA Soil Conservation Service

# Drainage



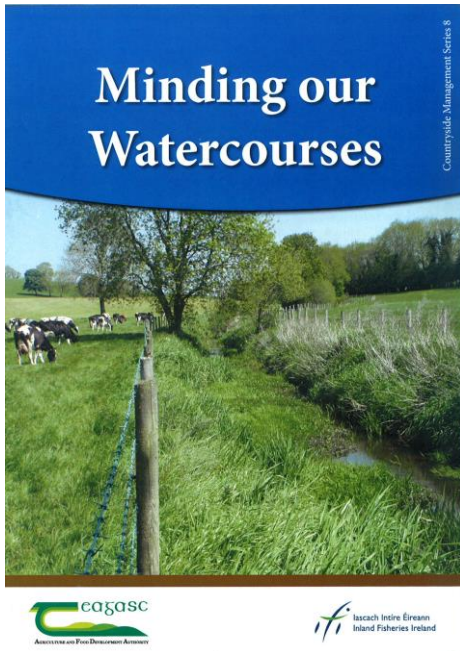


Urbanisation  
= flashy flows



# Teagasc – IFI initiative

Riparian zone management  
in agriculture:  
good practise benefits rivers



# Livestock ingress – sediment, nutrients, pathogens



# Water abstraction



# Flow regulation





# Man-made Barriers



# .....and back to.....River Continuity



**WFD: “*The continuity of the river is not disturbed ..... allows undisturbed migration of aquatic organisms and sediment transport*”**

# **Discontinuity** - Barriers as a HYMO pressure

Impedance leads to;

- Altered sediment flow
- Migration problems for keystone fish species
- Ponding effect upstream – loss of productivity
- Reduced fish ecological status due to barrier

# Barrier impact on sediment transport



# Sediment transport – sediment shoaling downstream of barriers



# Convergence of concerns in EU legislation

## EU WFD – hydromorphology and barriers

- EU Habitats Directive  
fish species

- EU Eel Regulations



# Barriers: Fish species of major concern in Ireland

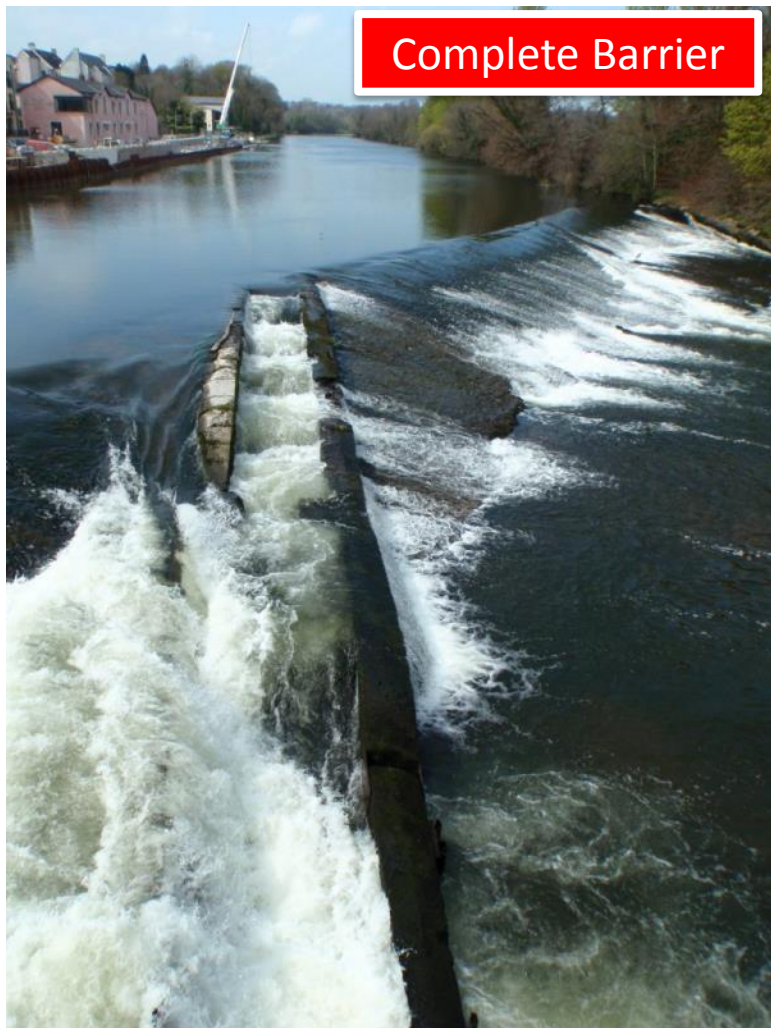


An underwater photograph showing two eels resting on a rocky riverbed. The water is murky and greenish-yellow. One eel is in the upper left, and another is in the lower right. The text "Barriers: Fish species of major concern in Ireland" is overlaid in the bottom left corner.

Barriers: Fish species  
of major concern in  
Ireland

# Sea lamprey passage issues in Irish rivers

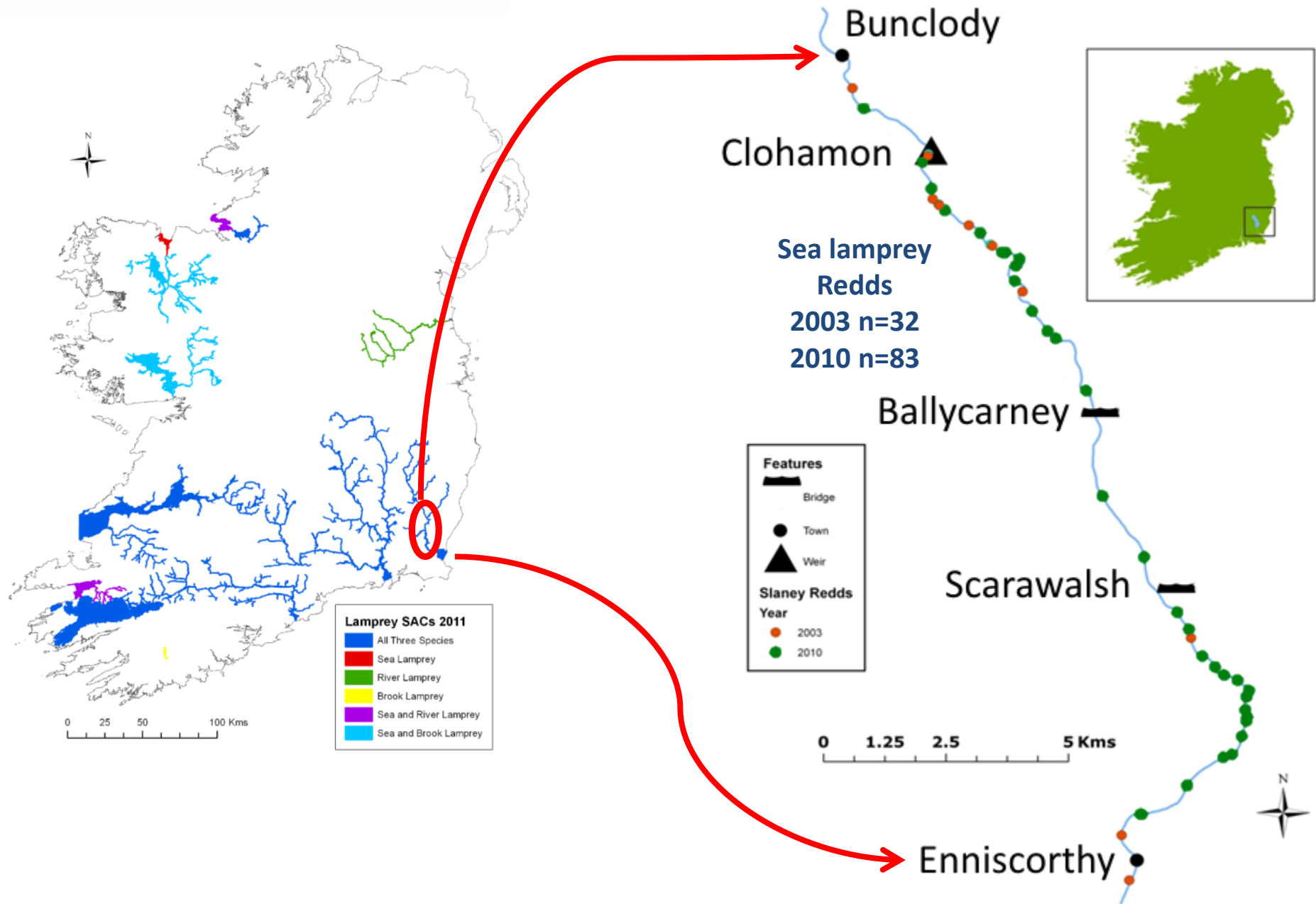
Complete Barrier



High Impact Partial Barrier



# River Slaney SAC – sea lamprey spawning: 2003 & 2010



# Slaney – Ballycarney Bridge

## – WFD III Barrier Assessment Tool



High Impact Partial Barrier

# Slaney – Clohamon Weir

## – WFD III Barrier Assessment Tool

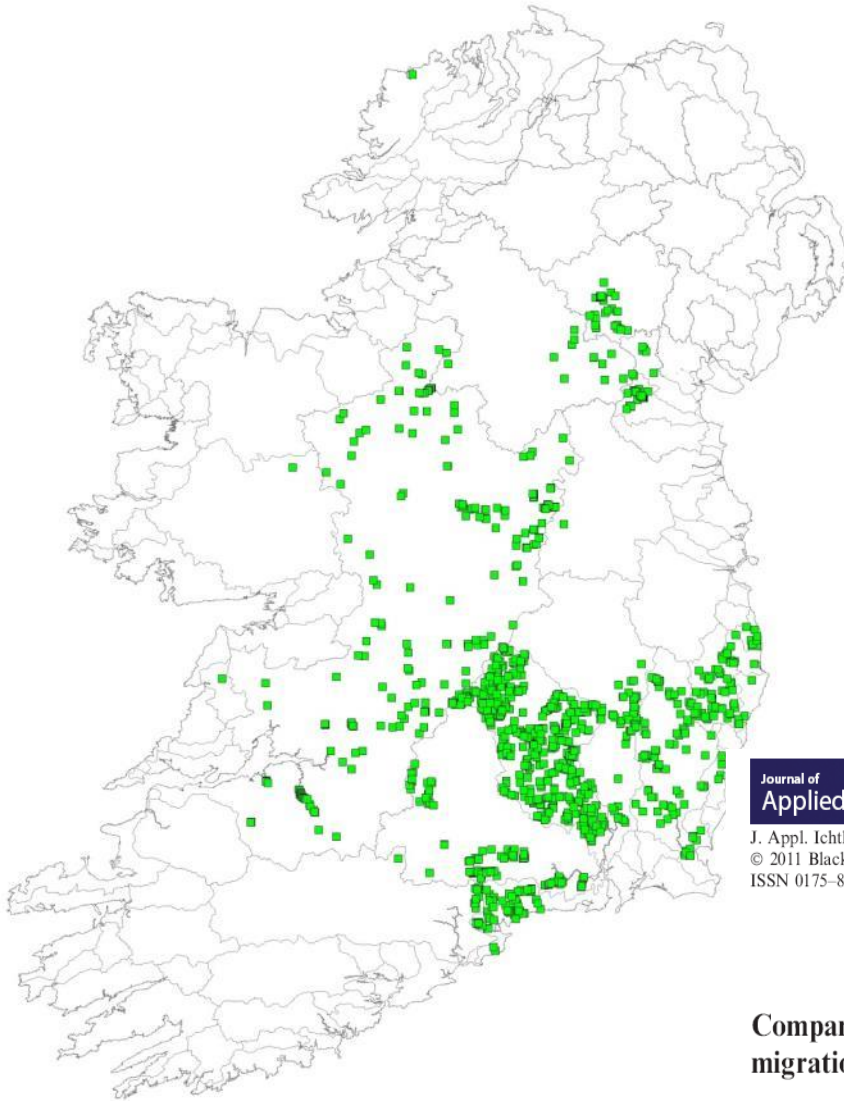


High Impact Partial Barrier

# National GIS layer of Barriers – work of IFI

Standard format for barriers:

- Geo-reference
- Photos
- Basic measurements
- Basic information



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DWK



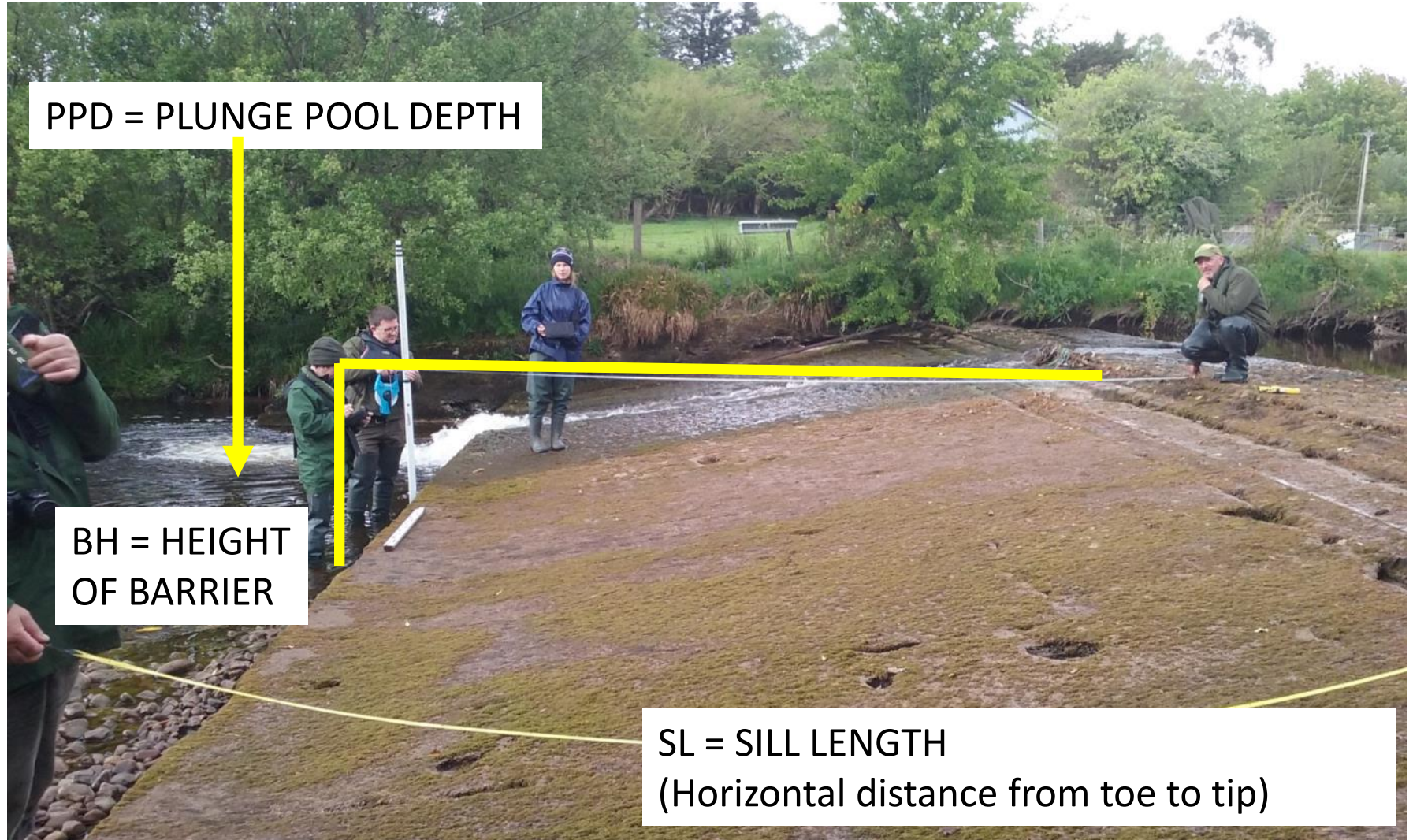
Received: December 9, 2010  
Accepted: March 14, 2011  
doi: 10.1111/j.1439-0426.2011.01855.x

## Comparison of field- and GIS-based assessments of barriers to Atlantic salmon migration: a case study in the Nore Catchment, Republic of Ireland

By P. G. Gargan<sup>1</sup>, W. K. Roche<sup>1</sup>, S. Keane<sup>1</sup>, J. J. King<sup>1</sup>, A. Cullagh<sup>2</sup>, P. Mills<sup>3</sup> and J. O' Keeffe<sup>4</sup>

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# IFI staff training



# WFD 111 (SNIFFER) barrier passability: detailed assessment where modification is proposed



# ReConnect – EPA-funded 2016-19

- UCD multi-disciplinary team
- Inventory of barriers in selected sub-catchments with IFI protocol
- Development of app for Citizen Science to facilitate sightings of barriers – geo-reference and image!!



# The Morphological Quality Index (MQI) – a brief intro.....

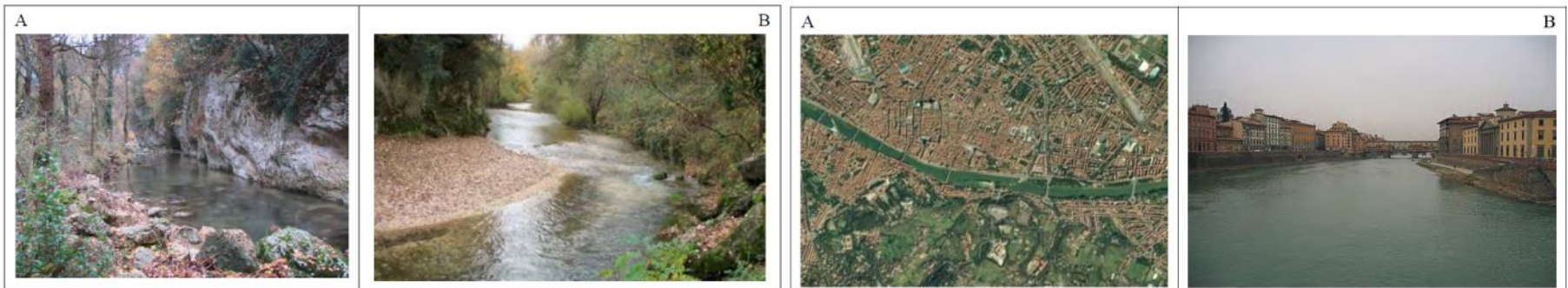
- Italian tool being refined for Irish Rivers
- Hydromorphological characterisation
- Classify the morphological quality of rivers
- Morphological component - evaluates
  - Geomorphological functionality
  - Artificiality
  - Channel adjustments



IDRAIM – stream hydromorphological evaluation,  
analysis and monitoring system

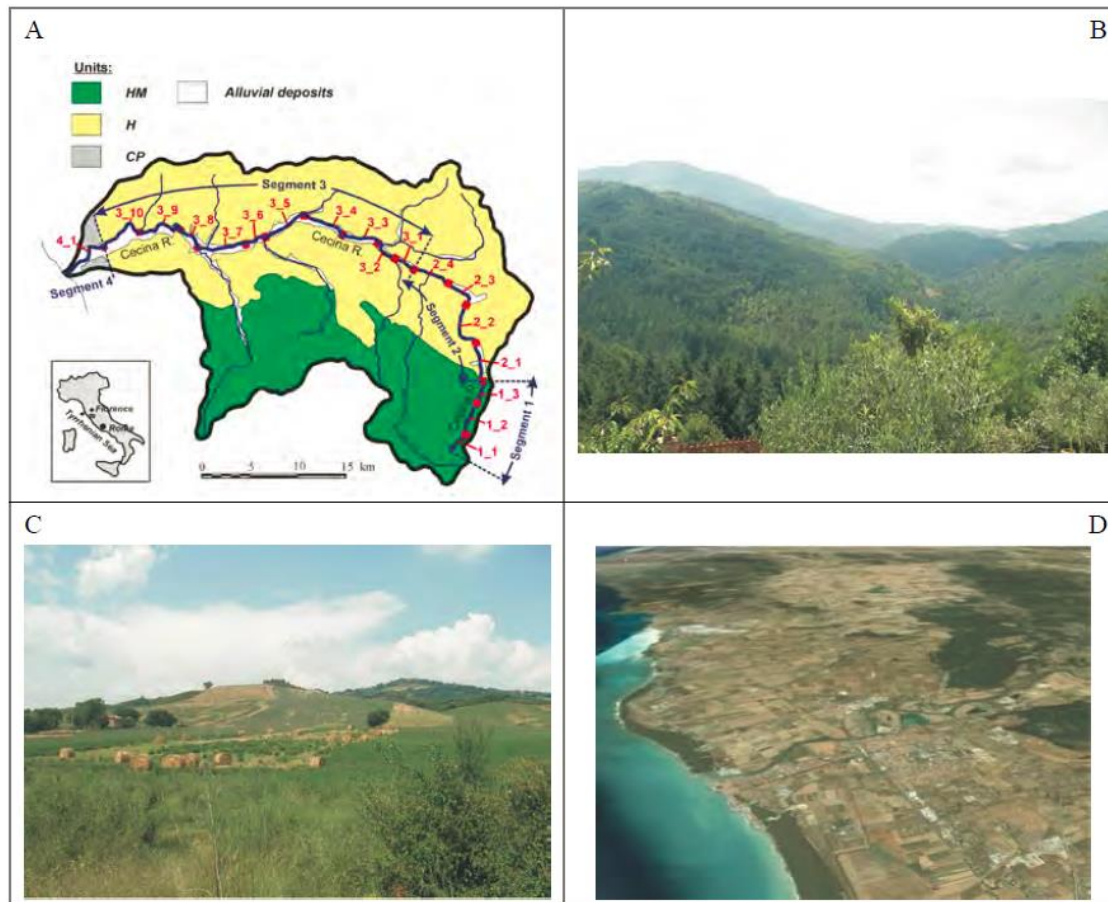
**Guidebook for the evaluation of stream  
morphological conditions by the  
Morphological Quality Index (MQI)**

Version 1.1



# MQI

- Outputs
  - typologies
  - increased understanding
  - provide information to help diagnose issues and identify measures



# Thank You



**IRISH RESEARCH COUNCIL**  
An Chomhairle um Thaighde in Éirinn



lascach Intíre Éireann  
Inland Fisheries Ireland