

# Investigating the Spawning Behaviour of Twaite Shad (*Alosa fallax*) on a Navigation River in the South-East of Ireland

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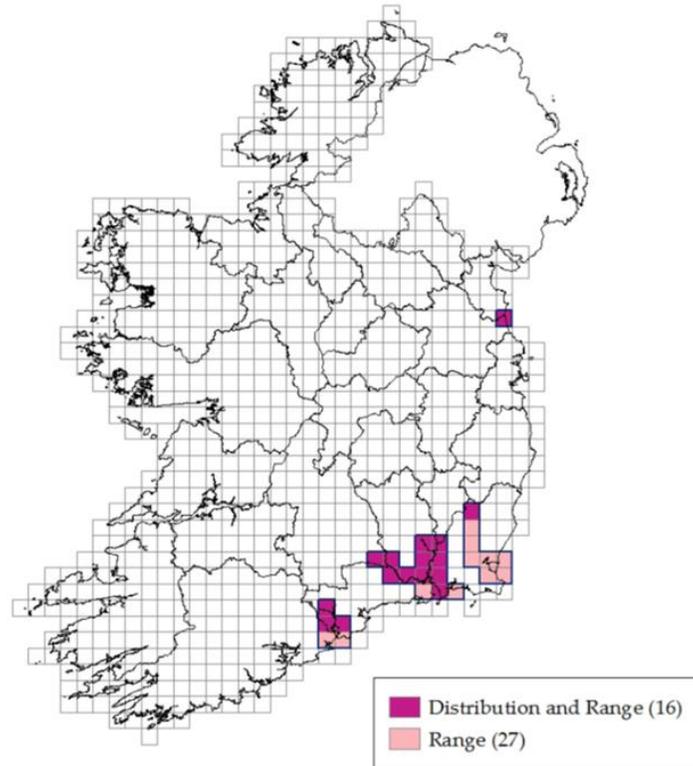
**Tony Brett, Nicola O’Gorman, Sean Rooney, Ciara O’Leary**



**LOCAL AND GLOBAL INITIATIVES:**

HOW SCIENCE SUPPORTS MANAGEMENT ACTIONS ON DIADROMOUS FISH

# Conservation Status of Twaite Shad (Annex II & V) in Ireland



Habitats Directive:  
Bad Conservation Status  
Article 17 Report (2019)

Irish Red List: Vulnerable

<https://www.npws.ie/publications/article-17-reports>

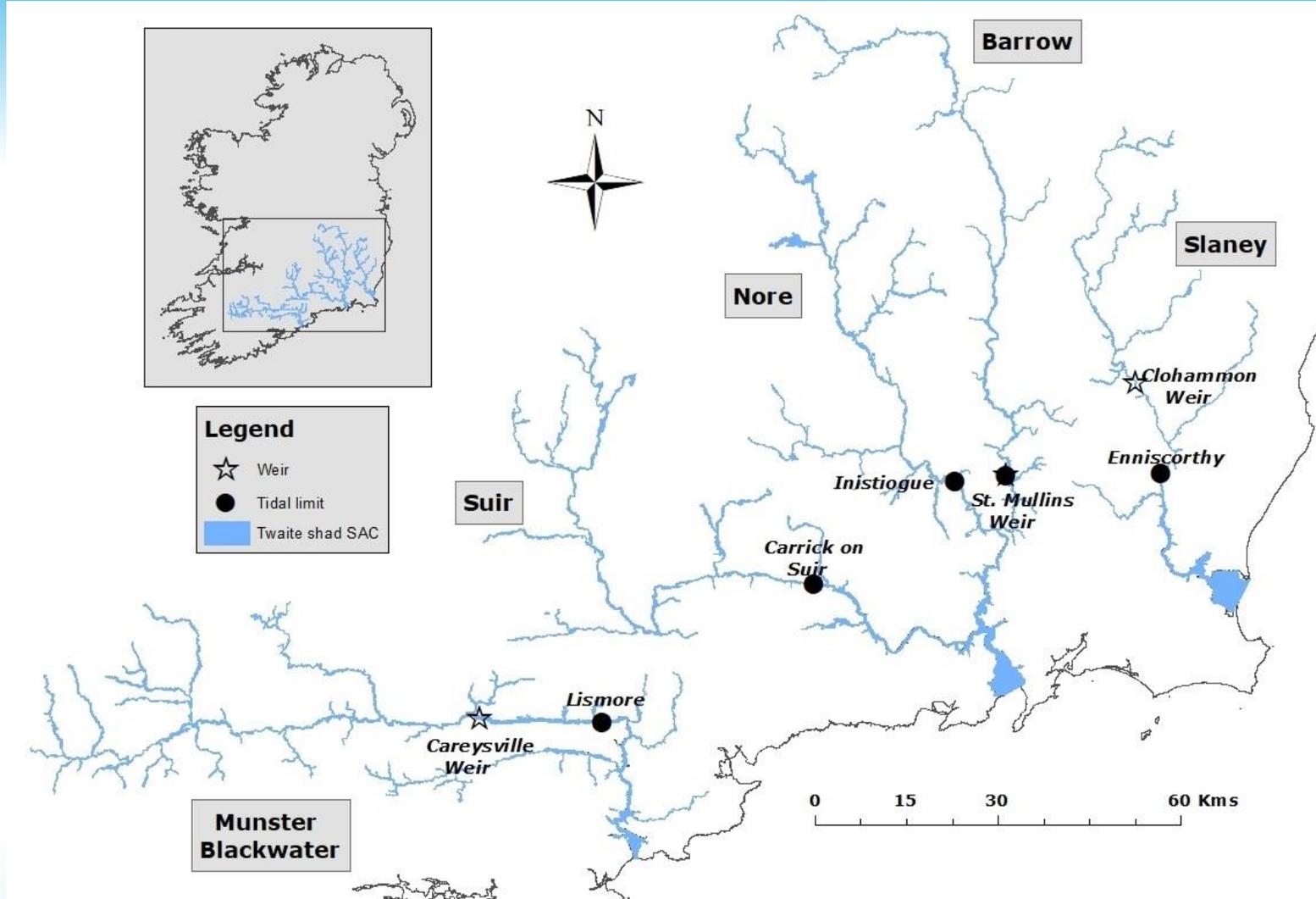
# Monitoring Twaite Shad

## Article 17 Reporting

- RANGE
  - POPULATION SIZE
  - HABITAT FOR THE SPECIES
  - FUTURE PROSPECTS
- Acoustic telemetry
  - Egg surveys
  - eDNA sampling
  - Seining and trawling surveys in estuaries for juvenile shad.

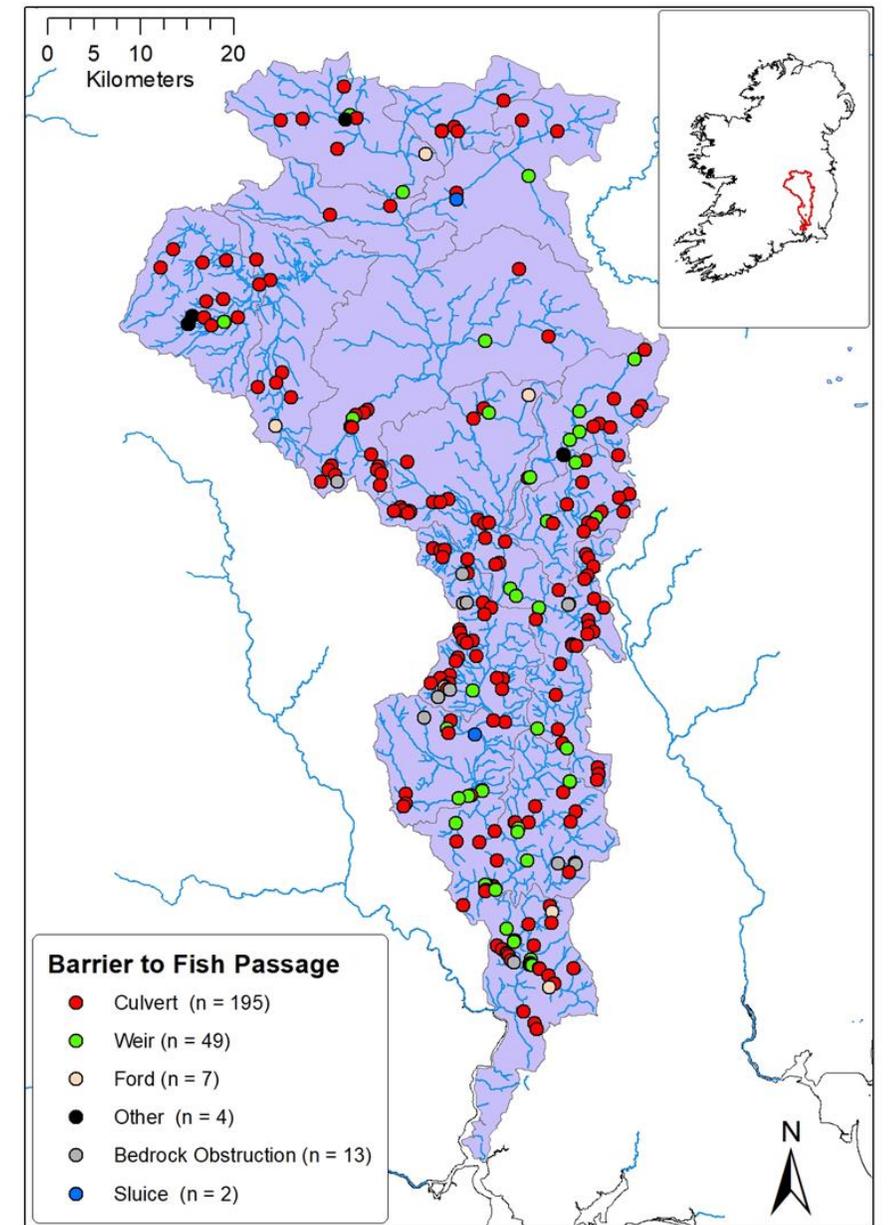


# Irish SACs for Twaite Shad

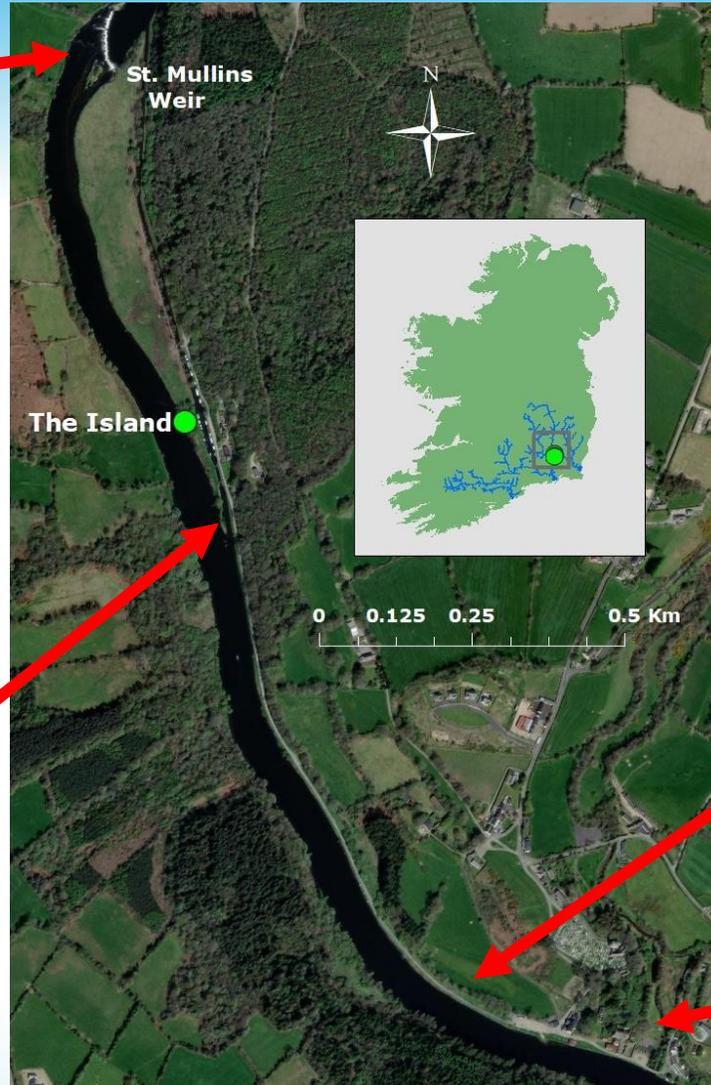


# River Barrow Catchment

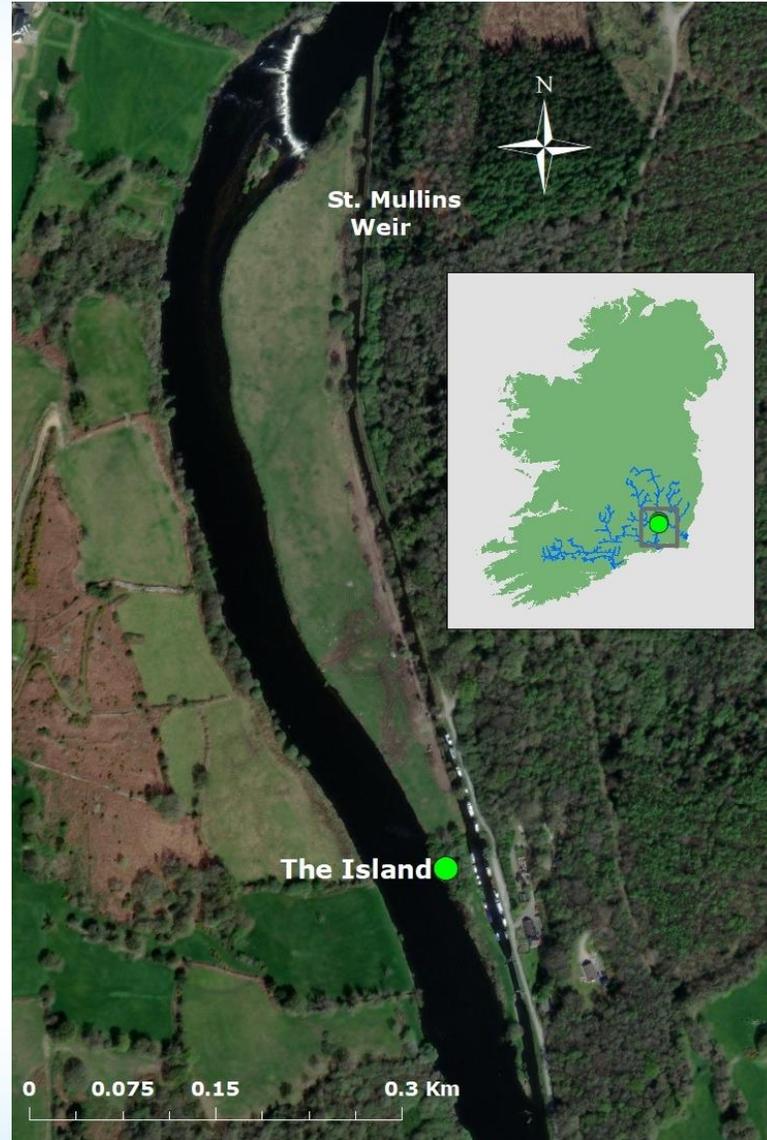
- Ireland's second longest river, area (3010km<sup>2</sup>)
- Navigable for 65km between Athy (Co. Kildare) & St Mullins (Co. Carlow)
- 22 large structures (mainly navigation weirs) located on the main stem Barrow



# St Mullins – R. Barrow



# Sea lamprey (*Petromyzon marinus*)

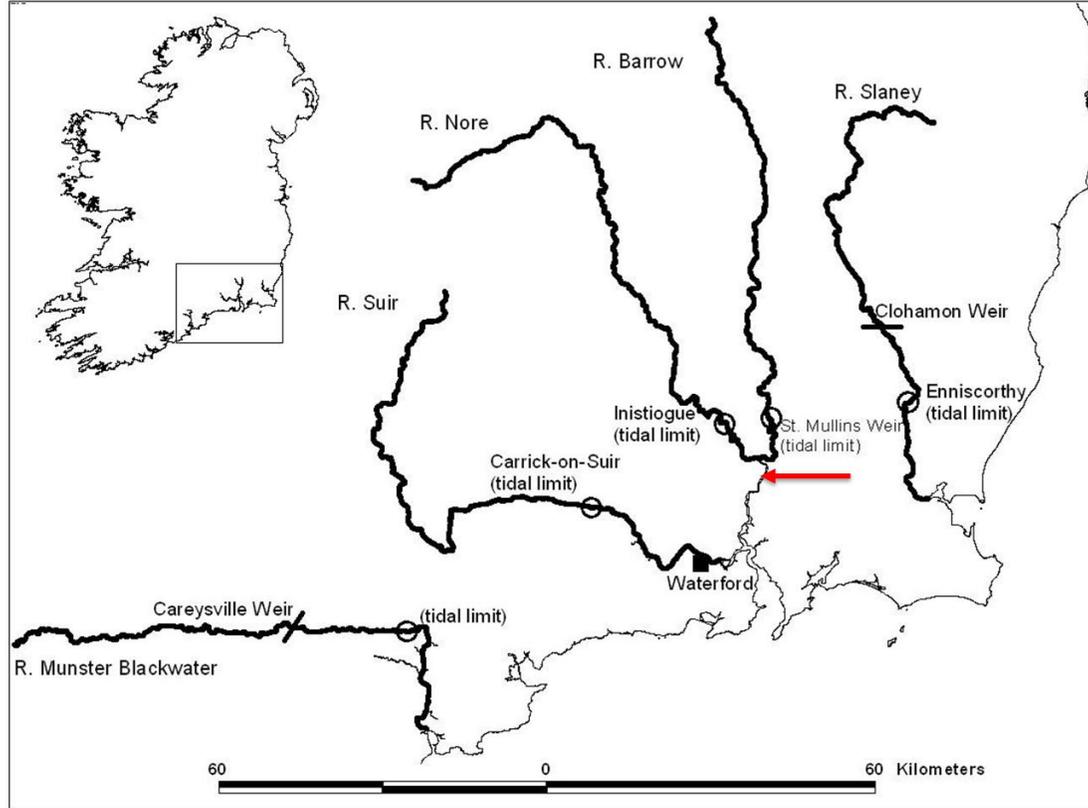


# Twaite Shad Acoustic Telemetry Study (2012 – 2017)

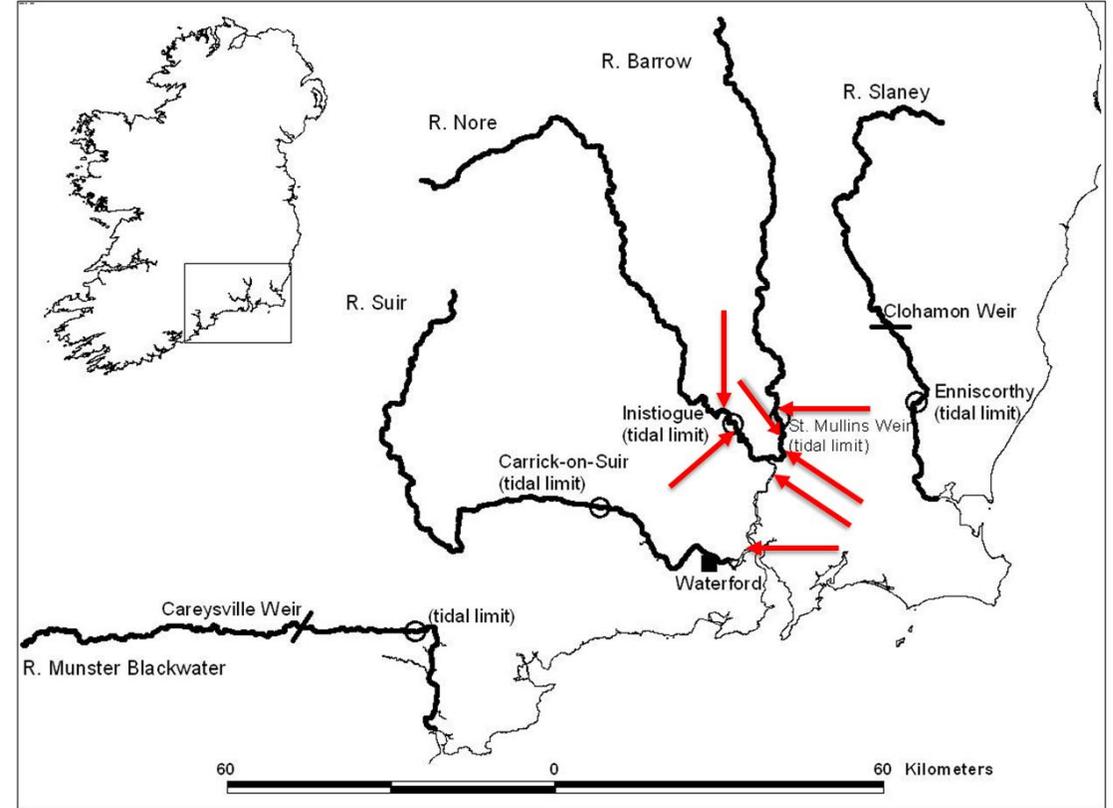
- Investigate behaviour & movements
- Importance of environmental variables (temp, tides, flow, etc.)
- Fish capture by drift netting and rod & line – 50 fish tagged
- Acoustic transmitters attached externally



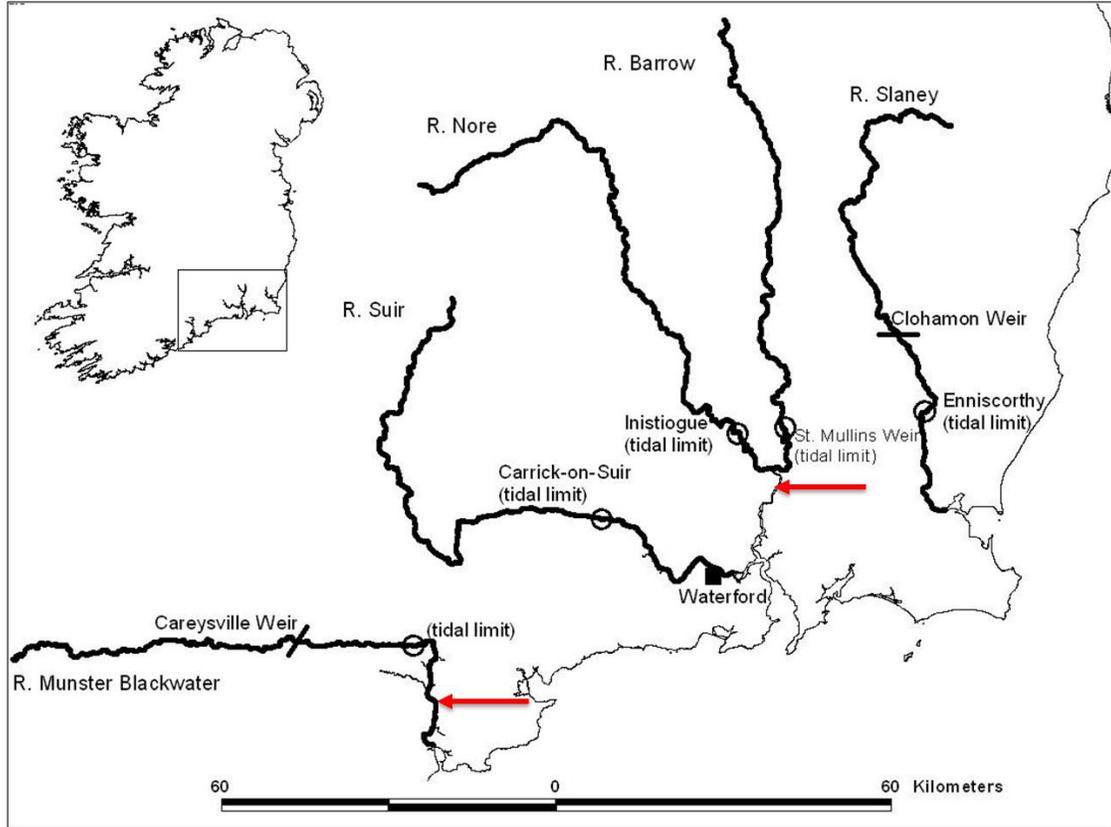
## Capture & Tagging Locations 2012



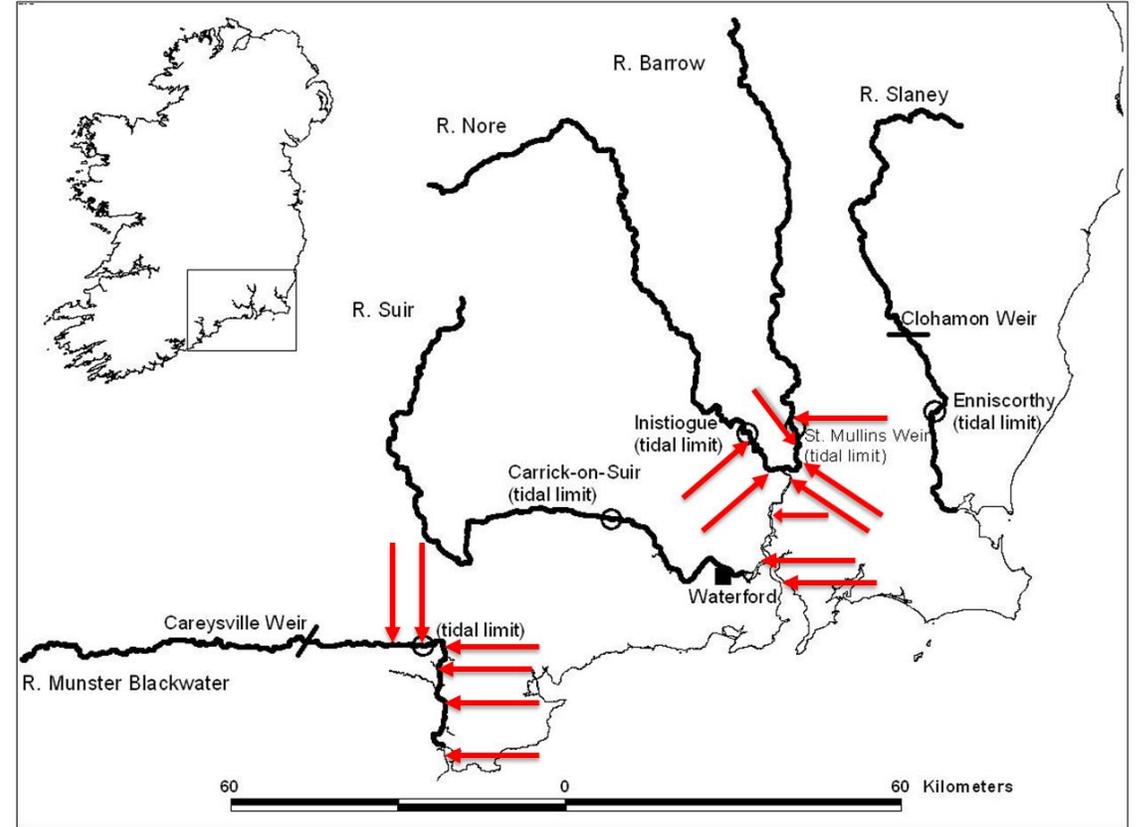
## Acoustic Receiver Network 2012



# Capture & Tagging Locations 2013



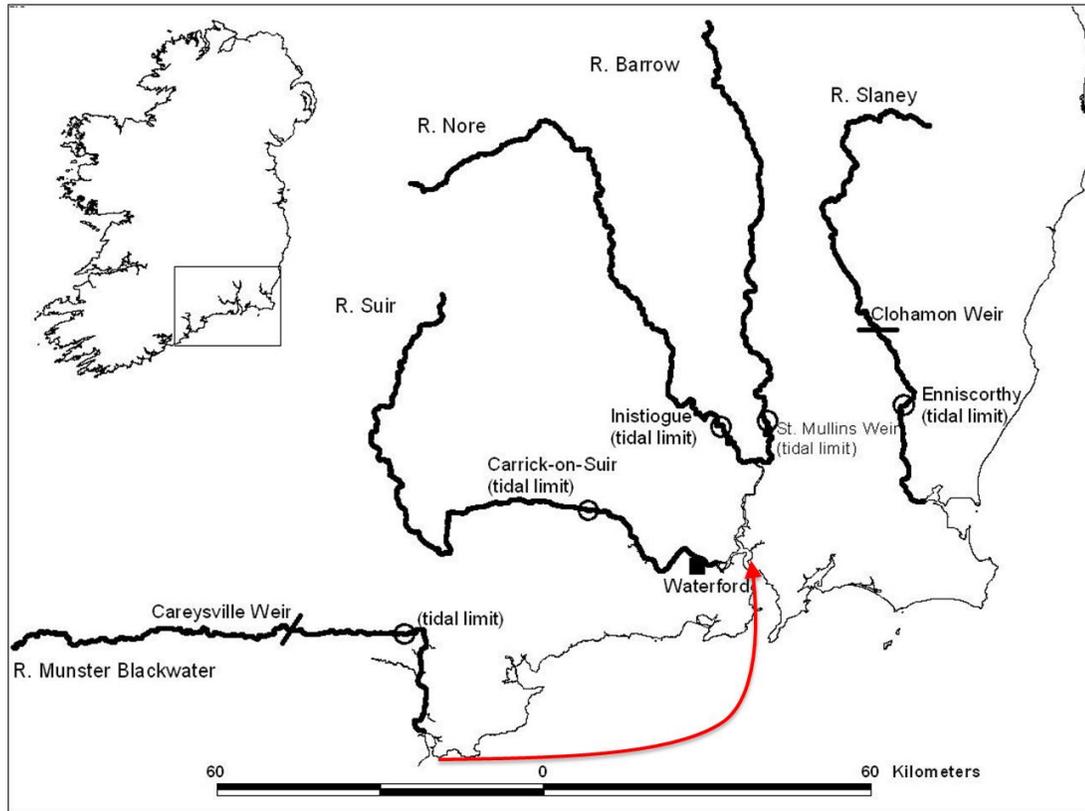
# Acoustic Receiver Network 2013



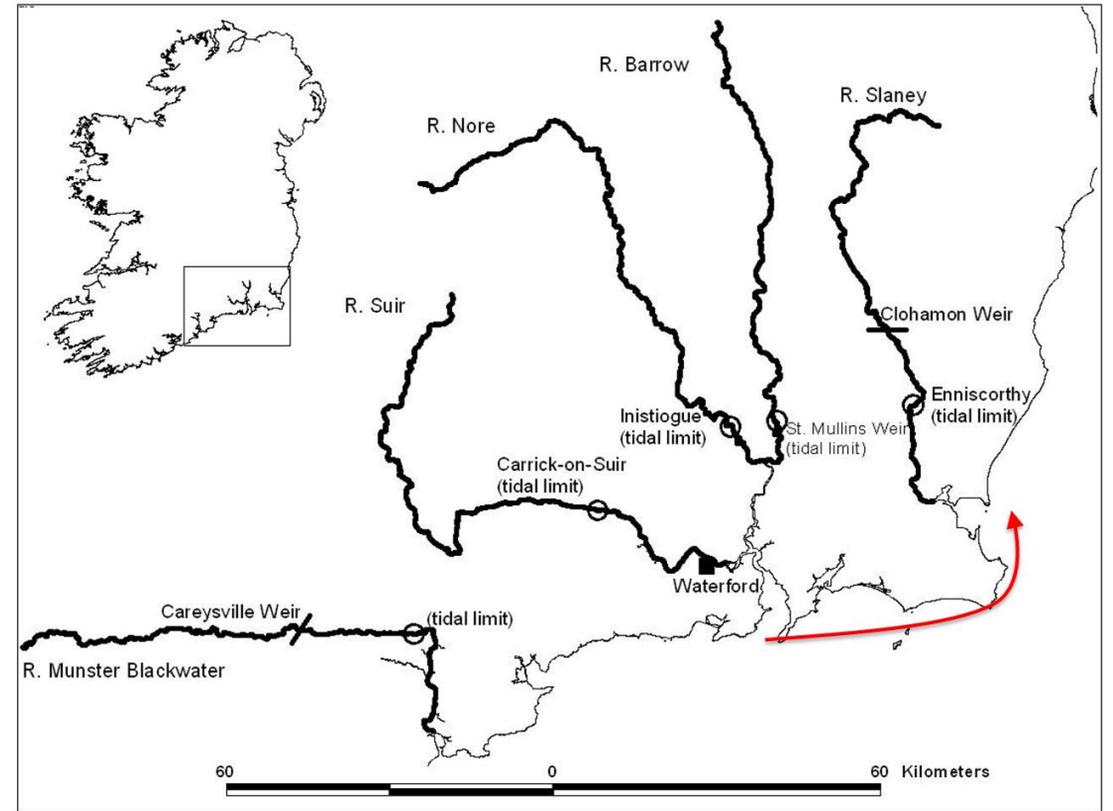


# Long Distance Movements

July 12<sup>th</sup> – 15<sup>th</sup> 2013



June 2<sup>nd</sup> – June 9<sup>th</sup> 2015



# Shad Egg & eDNA Surveys St Mullins 2021 & 2022

- Timing & duration of spawning
- Impact of weir
- Weekly samples April – July
- eDNA – High Tide
- Egg Kick Net Samples – Low Tide

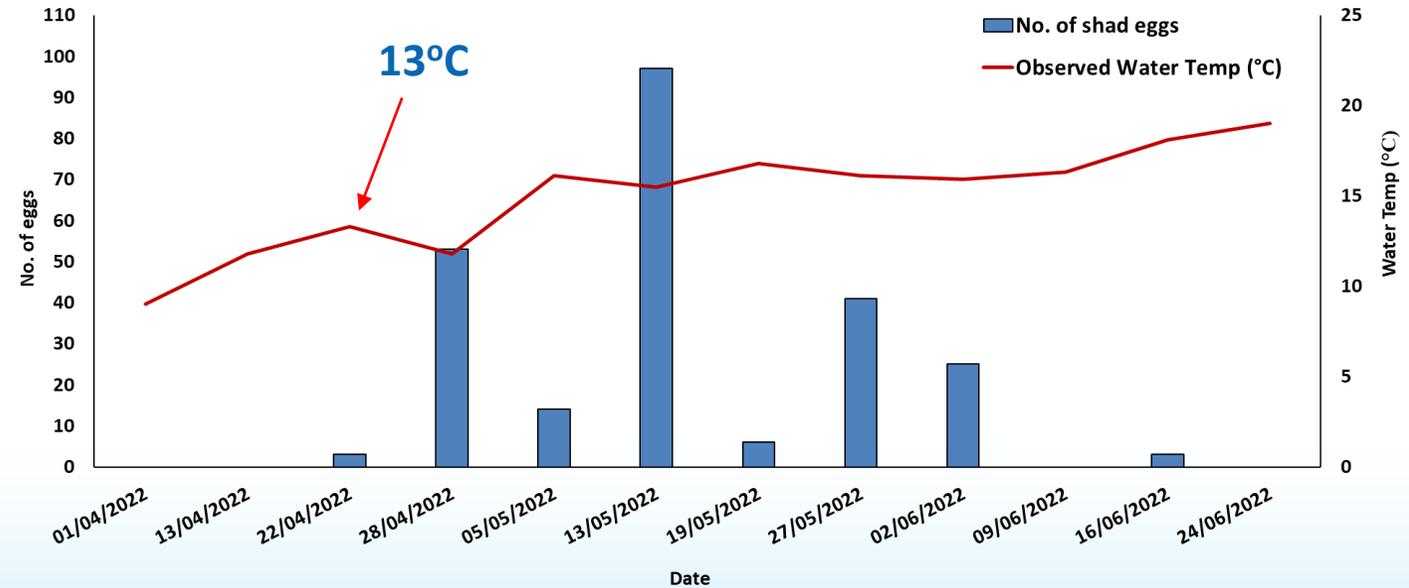
Egg Kick Sampling



### River Barrow 2021 (St Mullins)

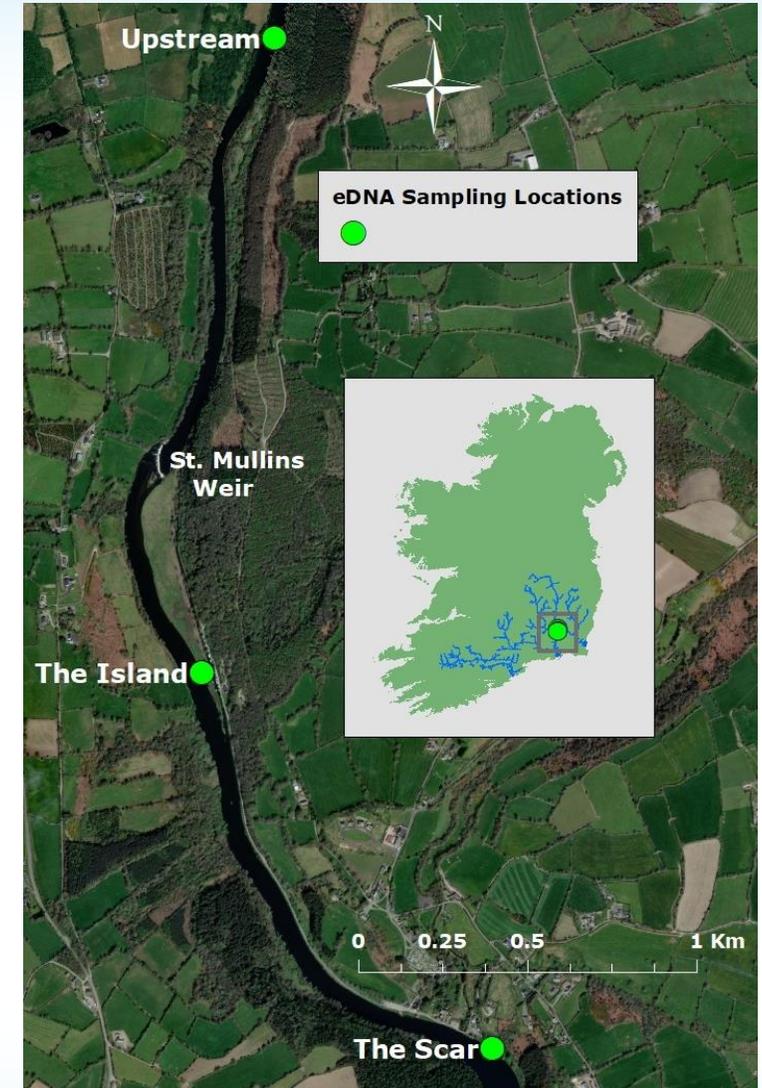


### River Barrow 2022 (St Mullins)



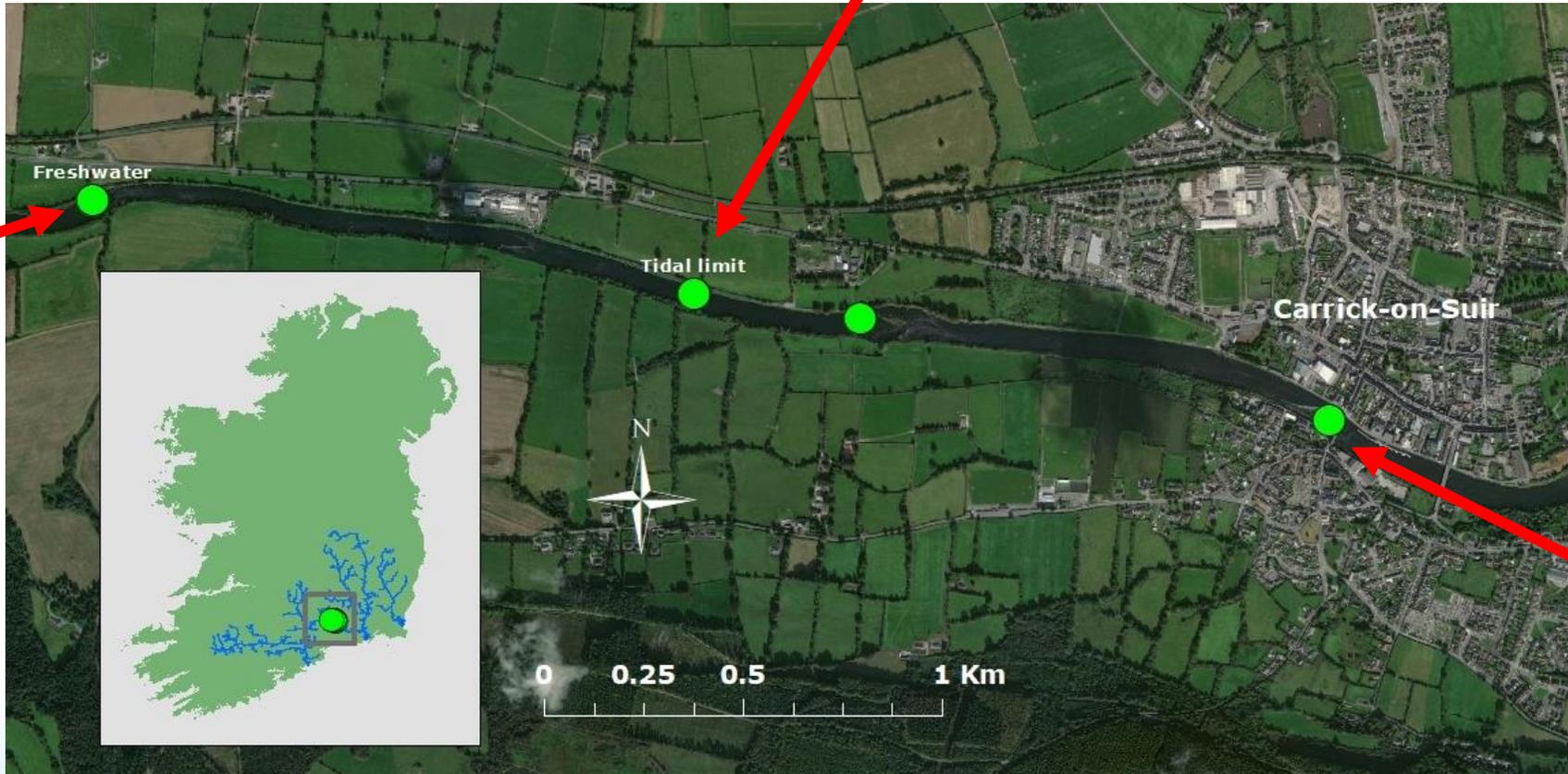
# Preliminary eDNA Results (2021)

- Low concentrations of DNA above weir
- Highest at d/s site (scar) – peak first week of sampling
- Lower than expected at island site

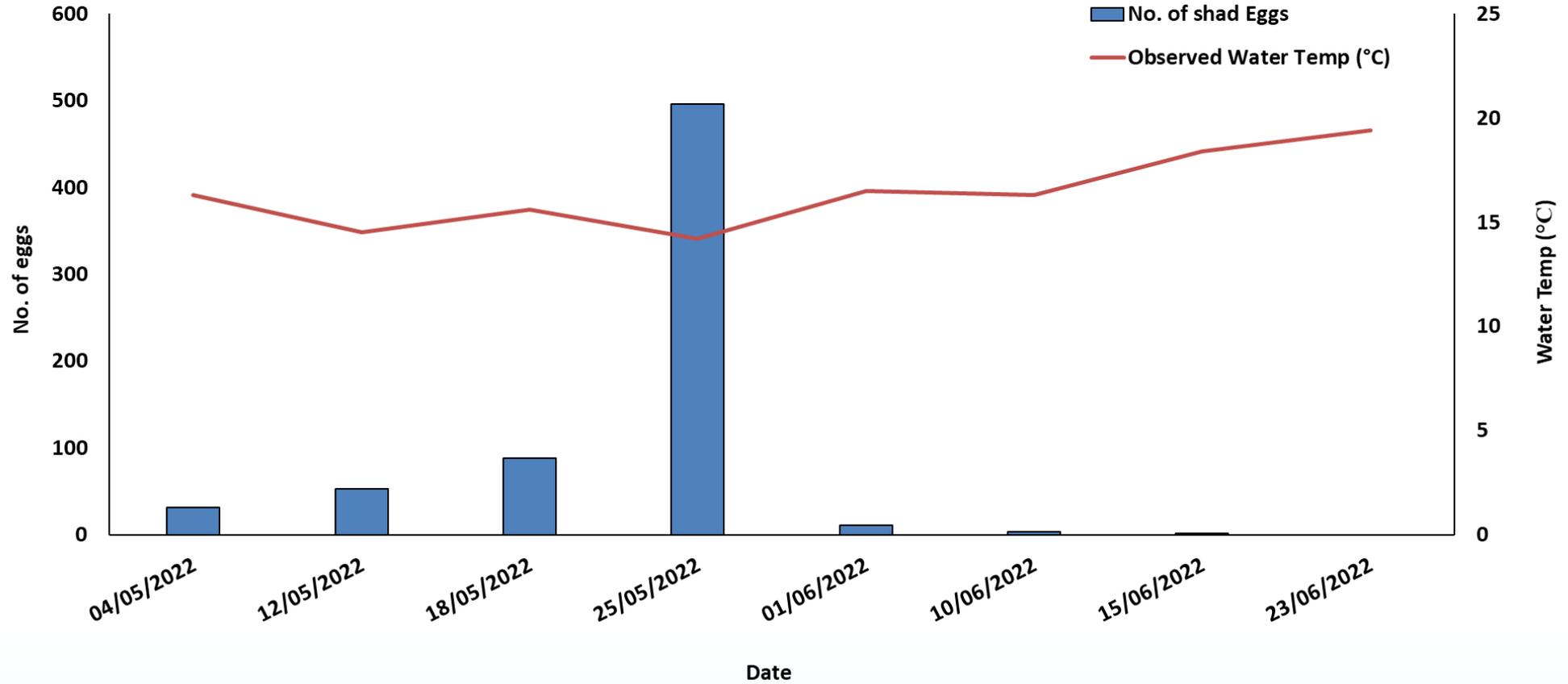


# River Suir Egg Surveys Location Location....

## Local Knowledge...



### River Suir 2022 (Top of Tidal Limit u/s Carrick-On-Suir)

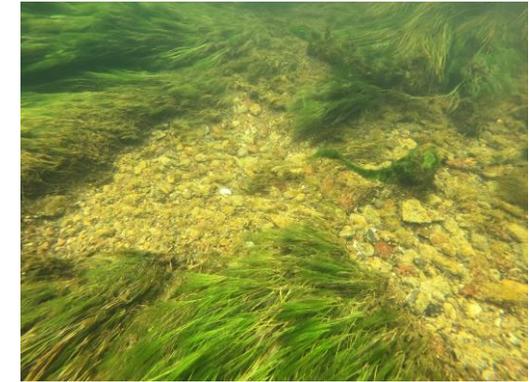
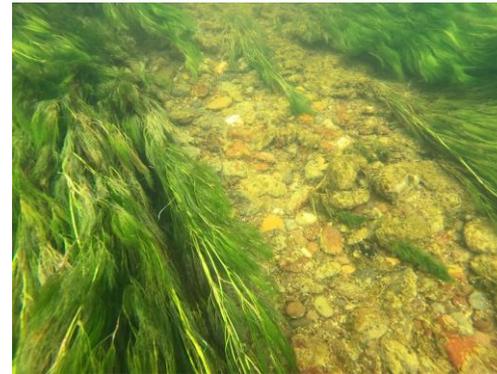


# Twaite Shad Spawning Substrate

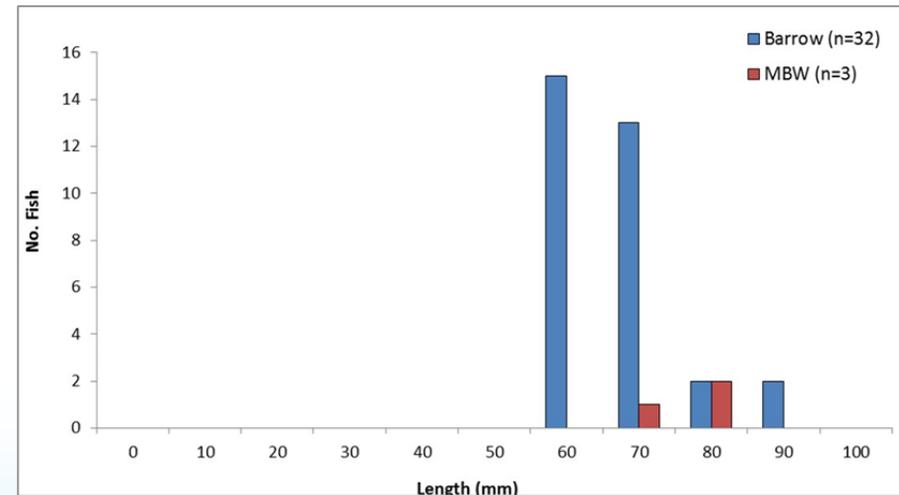
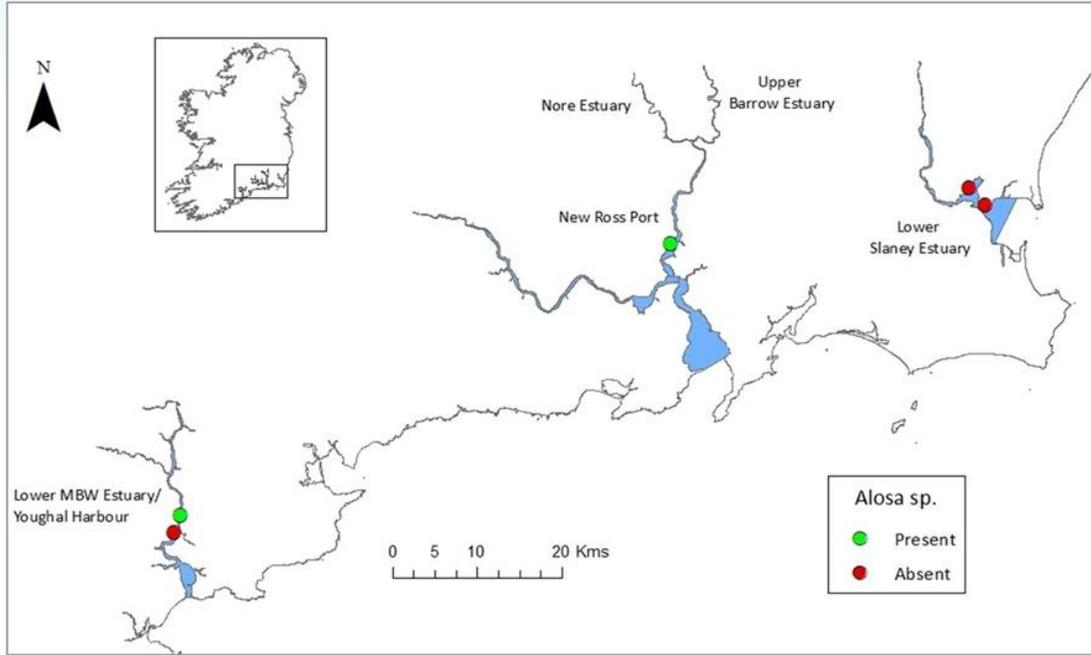
St Mullins, R. Barrow



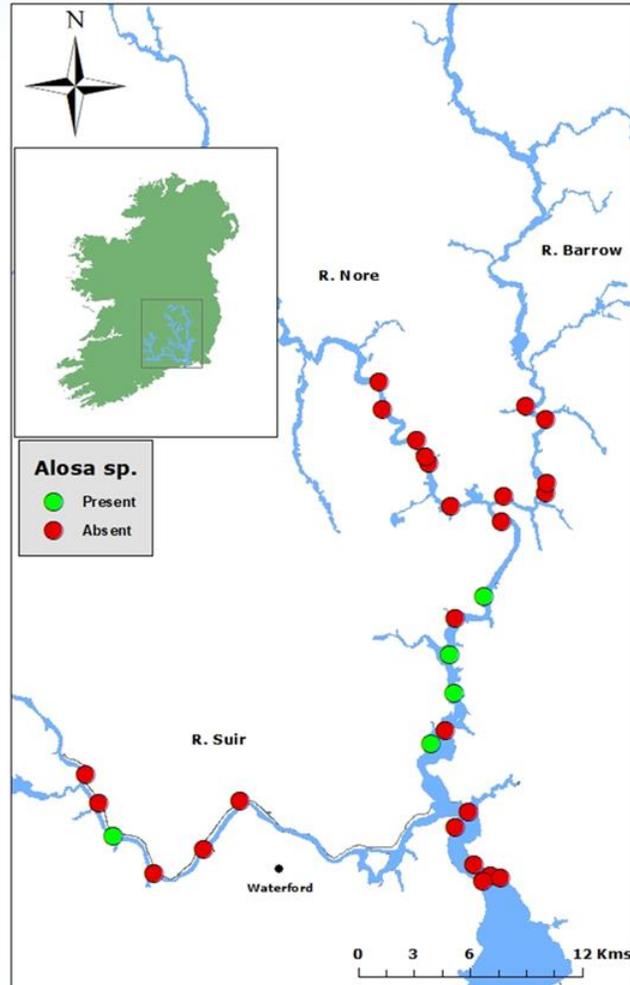
R. Suir



# Estuarine Seine Netting Surveys for Juvenile Twaite Shad (August)



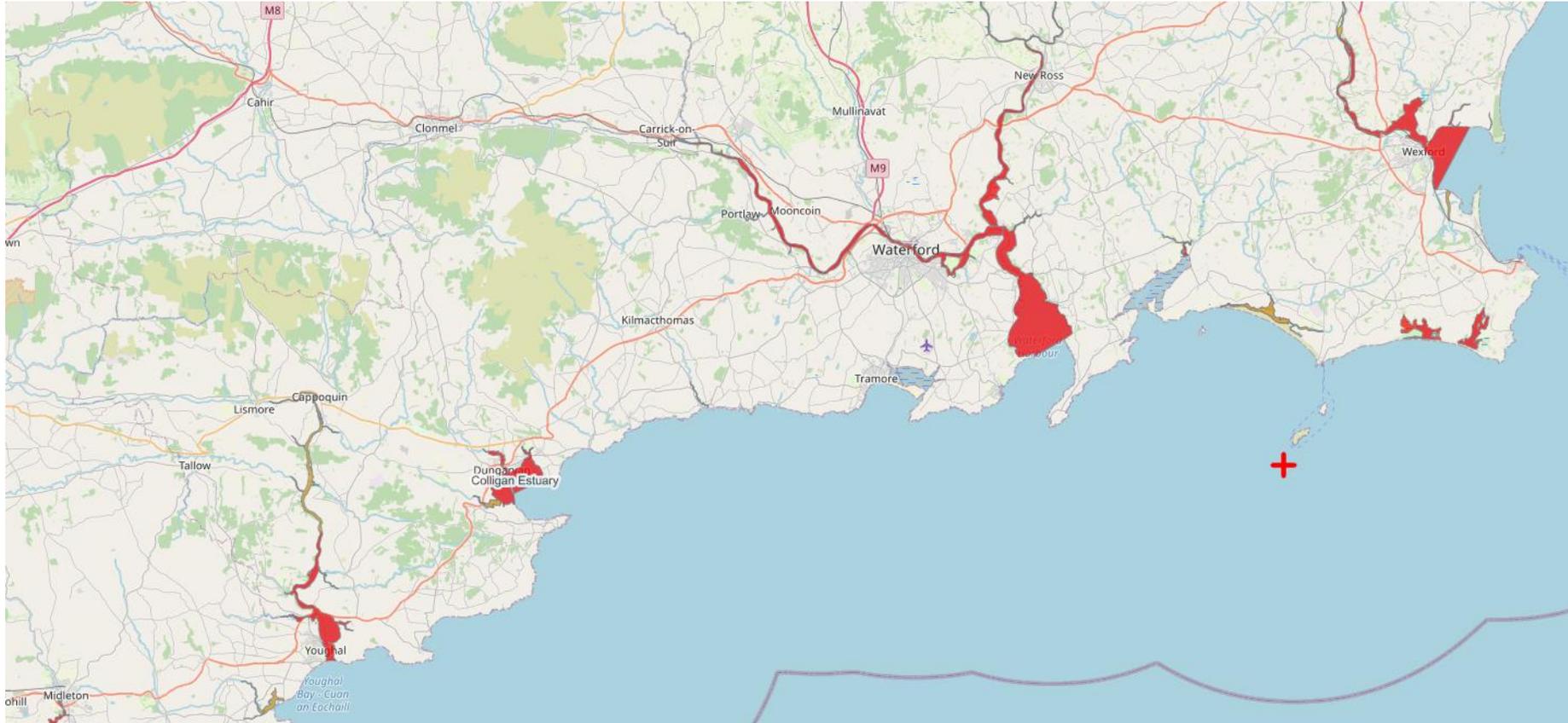
# Estuarine Seine Netting Surveys for Juvenile Twaite Shad (Sep/Oct)



# Summary of Research & Monitoring Findings

- Extremely mobile during annual spawning migration
- No migration beyond upper tidal limits – maximising fitness?
- Increasing temperature is an important cue – other variables need further investigation
- Synchrony of behaviour across rivers
- Mixing of tagged fish in downstream areas and forays into connected rivers
- Return to sea promptly after spawning completed
- Long-distance marine movement recorded
- Spawning occurring in April
- Protracted spawning period April – June peaking mid to late May
- Estuaries are important nursery areas for juveniles

# WFD 3<sup>RD</sup> Cycle 'At Risk' Transitional Waters



<https://gis.epa.ie/EPAMaps/Water>