

Integrated Aquatic Resources Management for Scotland, ROI & NI

IBIS

Research Overview
Colin Adams







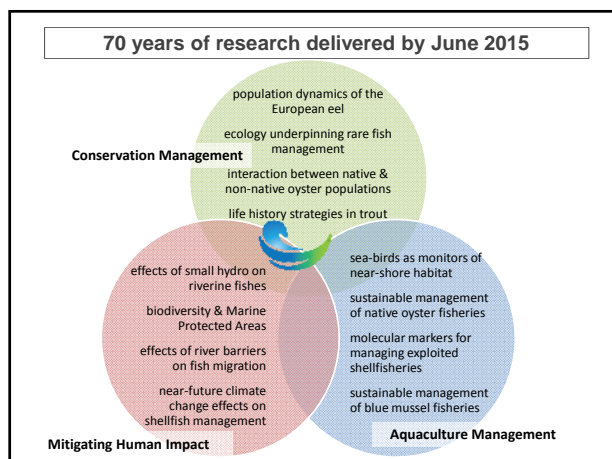


A project supported by the European Union's INTERREG IVA Programme managed by the Special EU Programmes Body



34 completed or current research projects


Heaton	Effect of in-stream barriers on the river migration of Atlantic salmon	Bryce	The use of the River Invertebrate Classification Tool (RICT) in the Fyle and Carrigrohilly Catchments, its application in management and the link between basic index scores and fish diversity grades
Stary	The population dynamics and migration of the European eel	McLennan	Impact of multiple barriers on salmon catchment penetration
van Leeuwen	Life history strategies in the sea trout (Salmo trutta)	McLennan	Impact of predation on Atlantic Salmon (Salmo salar) and Brown Trout (Salmo trutta) in the Lough Fyle Catchment - a Bioenergetics Modelling Application
Brinkley	Impacts of small scale hydro-power schemes upon aquatic communities	McLennan	Anguilliformity: stress effects in eels in Scotland and Ireland
Husker	The ecology underpinning conservation management of river headwater fishes	McLennan	Factors influencing fecundity in the European Eel, Anguilla anguilla
Salmon	Science based management strategies for improving yield of lake trout, Myxine salmoides, in hatchery culture	McLennan	Operating costs in the Lough Fyle oyster fishery
Shawley	Science based management strategies for environmental & commercial sustainability of native eelers	McLennan	The importance of size-frequency relationships in the management of the European Lobster, Homarus gammarus
McLennan	Developing molecular markers for application in the management of exploited stocks of the European eel, Anguilla anguilla	McLennan	The effect of infection with the sea louse parasite, Anguillula anguillae, on the lipid content of the European eel, Anguilla anguilla
Southwell	Predicting impacts of near future climate change on shellfish stock management	McLennan	Aquaculture vs other anthropogenic disturbances: The effects on water birds in Carrigrohilly Lough
Davies	Impacts of natural spread of non-native species & interactions with native species	McLennan	Conservation limits & Atlantic Salmon (Salmo salar)
Chisholm	Guidelines on monitoring of intertidal habitat	McLennan	Conservation interactions between shellfish and aquaculture in Carrigrohilly Lough
Clarke	Effects of Marine Protected Areas on mixed populations, biodiversity and fisheries	McLennan	Developing best practices for C. gigas producers
		McLennan	Interactions between shellfish fisheries and wildfish in Lough Fyle
		McLennan	Assessment of current predation on Atlantic salmon smolts in Fyle catchment
		McLennan	Conservation ecology of freshwater pearl mussel, Margaritifera margaritifera
		McLennan	Early life phenotypic and genetic structuring in Brown trout populations
		McLennan	Developing habitat based production models for juvenile Atlantic salmon
		McLennan	Practical control methods for aquatic invasive species
		McLennan	Practical control methods for aquatic invasive species





Project Partners :

- Loughs Agency
- Scottish Centre for Ecology & the Natural Environment – University of Glasgow
- Marine Lab. - Queens University Belfast

Robert Brackley


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The effect of small scale in-stream hydro-schemes on riverine fishes


- Small-scale in-stream hydro-electric generating schemes are burgeoning
- The impact of this new technology on ecosystems is poorly understood

This project is :

- Using radio telemetry, PIT tagging to quantify salmonid behaviour
- Instrumented weir and Archimedes screw generator
- ultimate goal provide clearer guidance on appropriate siting of small hydro schemes




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2013 Fieldwork

Field site in NE Scotland
River Don

Travis van Leeuwen

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"Life history strategies in *Salmo trutta*"

- Sea trout support important fisheries
- numbers have been dropping rapidly Ireland/Scotland over the last 2 decades
- Q – What is a sea trout ?
- What individual characteristics promote sea migration?
- What environmental conditions promote sea migration?

This project is:

- Individual fish characteristics – size growth & metabolic rate
- Environmental conditions that promote smolting – growth opportunity
- Genetic background – do sea trout and brown trout always derive from the same population?



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Disentangling Genetics from Environment

Resident family

Migratory family

Mixed family

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Growth, Metabolic effects & Smolting

Abundant food

Scarce food

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James Barry

"Population dynamics of the European eel"

Population size and supported biomass in contrasting freshwater habitats in a single catchment

Freshwater lake movement patterns in eel

Silver eel – migration pattern and speed

Fitness consequences of different foraging strategies in eel

Study sites: Ireland and Scotland

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Jenny McLeish

The effects of *Anguillicola crassus*, the invasive swimbladder parasite on swimbladder function

Using ultrasound to detect parasite infection

Non-destructive technique

Physical effects of infection on swimbladder function

Journal of Fish Diseases (In Press)

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Oliver Hooker

The evolutionary ecology underpinning biodiversity in freshwater fishes

- There is significant phenotypic and genetic variation within a species rarely recognised by conservation strategies
- How does this variation manifest?

This project is:

- Focussed on brown trout and Arctic charr
- Demonstrating the complexity of sympatric intra-species evolutionary divergence
- Using laboratory experiments to identify the evolutionary mechanisms promoting diversity
- Using field studies to determine phenotypic and genetic structuring patterns in the wild

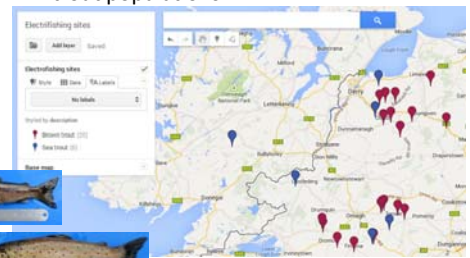
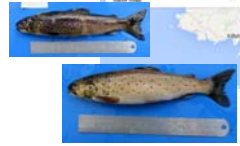


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Jessica Fordyce

“Phenotypic and genetic structuring in trout populations”

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Martin Hughes

“What is a ferox trout?”

Acoustic tracking in Lough Finn (Donegal)

Collecting broodstock from “ferox” trout in Wester Ross – common garden experiment




Social media to collect phenotype data and scales over 4,000 www hits

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Millie Piggot

“Sympatric phenotypic polymorphism in *Salmo trutta*”


Some anecdotal evidence of sympatric polymorphism in resident brown trout – Loch Laidon, Perthshire

Project will:

- Use geometric shape analysis 2D and 3D,
- classical stomach contents analysis
- To look for trophic polymorphism in trout

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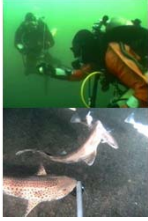
Joanne Clarke

The effects of Marine Protected Areas on animal populations, biodiversity & fisheries

- MPAs promoted as a method for protecting biodiversity, providing natural population structures and managing exploited fish populations
- No-take zone around off-shore structures may act in part like MPAs
- The positive effects of MPAs have been only partly quantified
- We know very little about the negative effects


This project is quantifying the effect of MPAs:

- as a source of juveniles to fisheries
- the effect of predator "spill-over"
- Connectivity between MPAs and fishing areas



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Nina O'Hanlon

Sea birds as monitors of the near shore habitat

- Intertidal habitats are under significant pressure
- The EU Directives place statutory burdens of monitoring & habitat improvement
- Intertidal seabirds have the potential to provide effective but rapid assessment of such habitats

This project is :

- existing data to test the ability of top predators to assess habitat functioning
- field trails to relate intertidal habitat quality with patterns of seabird colony "health"
- Foraging movement and community structure
- Develop effective and rapid monitoring tools to determine intertidal "health"



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Much, much more information about the project on our website ...

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Life history strategies & population structure in trout

 <p>Travis van Leeuwen "Life history strategies in <i>Salmo trutta</i>"</p>	 <p>Jessica Fordyce "Phenotypic and genetic structuring in trout populations"</p>
 <p>Martin Hughes "Movement, growth and resource use in lake dwelling trout"</p>	 <p>Milly Piggot "Sympatric phenotypic polymorphism in <i>Salmo trutta</i>"</p>

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Travis van Leeuwen
"Life history strategies in *Salmo trutta*"





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