Developments in Inland Fisheries Ireland Research

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Iascach Intíre Éireann
Inland Fisheries Ireland

Welcome to the Newsletter

In this issue, we share a number of highlights from IFI Research & Development's research seminar, an annual event at Christmastime in which we gather to reflect on the year's work and share results and ideas with our colleagues.

This issue also highlights how IFI researchers work with international colleagues to exchange ideas on best practice for research to support evidence-based management and to develop protocols to answer research questions that we have in common between countries.

As always, we thank all IFI staff who contribute to our research programmes and to this newsletter.

Slán,

Dr. Cathal Gallagher, Head of Research & Development

In this issue

Research Seminar 2023

Paul Franklin presenting on research for evidence-based freshwater policy

IFI research staff attending the seminar at Citywest HQ

On December 12th, IFI Research & Development held a seminar in which research staff gathered to give brief talks on their highlights from their work during the year. This Christmastime event gives IFI staff an opportunity to show the breadth of their work throughout the year and share some of their exciting and interesting results with their colleagues.

The guest speaker at the seminar was Paul Franklin, who leads the Freshwater Species Ecology & Management programme at New Zealand's National Institute of Water and Atmospheric Research (NIWA). In his engaging presentation on fish passage and environmental flows in New Zealand, Paul emphasised his belief in connecting science to action, thereby getting the right scientific information to decision makers to enable evidence-based policy for management of freshwaters and the ecosystem services they provide.

While visiting Ireland, Paul took part in meetings and field trips with IFI research staff to discuss approaches to assessment of fish passage at barriers. This will be a key element of the forthcoming National Barrier Mitigation Research Programme as IFI develops solutions to restore rivers to a natural, free-flowing state and to ensure that rivers maintain environmental flows, which are adequate quality, quantity and timing of water flows required to maintain ecosystem services in rivers, including fish passage and mitigation against adverse impacts of climatic change.

Thirteen speakers from IFI's Research & Development Division then gave brief talks about the notable achievements and talking points from 2023. Overall, a few themes that ran through the talks were application of new and advanced technologies in fisheries research, growing sophistication of data management and analysis, importance of engagement with anglers and charter skippers as citizen scientists and innovation in approaches to answering research questions.

To support sharing of research and ideas across IFI, the talks were simultaneously broadcast as a webinar, giving IFI staff around the country an opportunity to "tune in" and catch up with developments in fisheries research in 2023.

IFI Research Seminar Speakers & Topics

Conor McCormick: Pink salmon eDNA monitoring.
Amy McCollom: Soft engineering works in river restoration (EREP).
Rob Cruikshanks: Glass eels (EMP).
Tony Brett: Outreach in protected species research (HD Project).
Róisín Donovan: National Barrier Mitigation Research Programme.
James Barry: Lough Sheelin fish tracking (CCMRP/OPWCRP).
Ronan Matson: New aquatic plant photographic guidebook.
Aoife Brennan: Managing climate research data (CCMRP/OPWCRP).
Aoife Walsh: Evaluating stream thermal sensitivity (CCMRP/OPWCRP).
Ciara Wögerbauer: Marine Sports Fish Tagging Programme.
Karina McLeod: Tuna CHART: 2023 season recaptures.
Eoin Leonard: sea angler diaries (IMREC).
Glen Wightman: SMOLTrack in Greenland 2023.

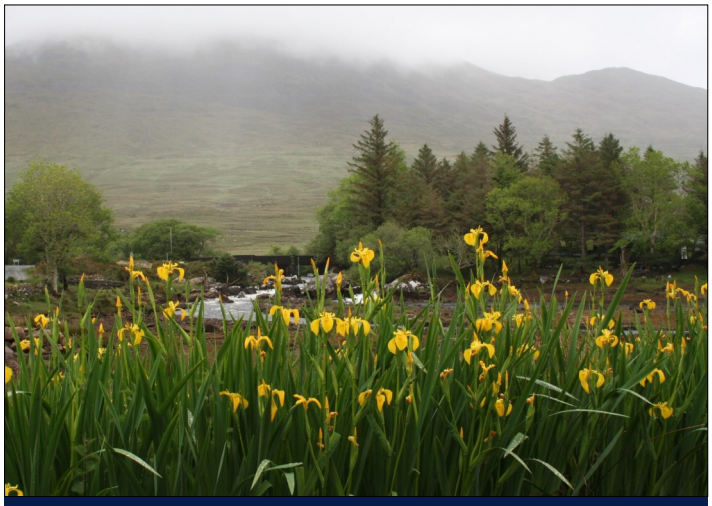
Newly Published: *"Aquatic Plants In Ireland — A Photographic Guide"*

IFI research staff have published a comprehensive new photographic guide to aquatic plants in Ireland. *"Aquatic Plants in Ireland — A Photographic Guide"* was compiled by Ronan Matson and Rossa O'Briain of the IFI Research & Development Division, in collaboration with Joe Caffrey of Invas Biosecurity, and edited by Paul Green, former Ireland Officer of the Botanical Society of Britain & Ireland (BSBI). In addition, the book features contributions from six expert botanists and a foreword by Matthew Jebb of the National Botanic Gardens.

Aimed primarily at both specialist botanists and non-specialist amateur naturalists alike, the new book's 576 pages are packed with over 1,200 colour photographs and diagrams and feature a wealth of information, such as distribution maps, taxonomy, ecology, and interesting facts about each species. The guide highlights key features to aid identification of 401 species or taxa of vascular flowering plants, as well as groups such as macroalgae, charophytes and bryophytes (mosses & liverworts). As well as native species, the guidebook includes alien invasive plant species that are found in Ireland.

The book features a user-friendly design in which the authors divide the plants into the riparian, marginal and aquatic habitat zones in which they are most typically found — an approach that aims both to place plants in their ecological context and to aid quick and accurate identification of plants in the field. This visually appealing and colourful book showcases the beauty and biodiversity of the aquatic plant life that grows in and around Ireland's waterways.

"Aquatic Plants in Ireland — A Photographic Guide" is available in a €40 softback edition and a €70 hardback edition, excluding postage. For purchase enquiries, please contact Ronan Matson at ronan.matson@fisheriesireland.ie.



Identifying species in their ecological context: riparian yellow flag

Detailed coverage provided on plant species, e.g., Himalayan balsam

Outreach & Engagement in Conservation Research for Protected Species

IFI's Habitats Directive Project is tasked with monitoring and reporting on fish species protected by the Habitats Directive, including shads and lampreys. As well as reporting data to guide conservation measures, the project also aims to increase knowledge and to promote awareness about some of these lesser known fish species found in Ireland.

Twaite shad are a popular target for specimen anglers during their spawning migration in each year. In 2023, the Habitats Directive team produced an information leaflet for anglers about shad distribution and conservation, as well as guidance on best handling practices for catch-and-release. Within IFI, the team has engaged with their regional IFI Operations colleagues, who provide vital support in surveys of lamprey spawning and salmonid redd counts, working with them in training sessions and demonstrations of new survey methods. The team has also released videos of lamprey spawning to give the public a glimpse into the life of these somewhat cryptic and unusual fish species.

Top: twaite shad. Bottom: sea lamprey spawning.

Pink Salmon eDNA Surveillance Programme

Pink salmon (*Oncorhynchus gorbuscha*) have been recorded in unprecedented numbers in a number of Irish rivers in 2017, 2019 and 2021. Pink salmon have a two-year lifecycle in which they migrate from the sea into rivers to spawn every other year, so in anticipation of the potential re-occurrence of this non-native fish species in 2023, IFI commenced an environmental DNA (eDNA) surveillance programme to monitor the presence of pink salmon in key catchments located throughout Ireland.

Only one pink salmon was captured in Ireland in 2023

Fish shed DNA into their aquatic habitat from their mucus, scales, etc., and this eDNA can be isolated from water samples and amplified for genetic analysis to detect whether species are present or not. Water samples were taken at repeated intervals at multiple sites along the river channel in 13 index catchments in July to November 2023, and the samples are preserved to detect whether pink salmon entered these river systems over this period. The project was funded by the Salmon and Sea Trout Rehabilitation, Conservation and Protection Fund and is intended as a precursor to IFI's involvement in PINKTrack, an EU-wide project supported by the North Atlantic Salmon Conservation Organisation (NASCO). It is envisaged that the eDNA samples will be analysed as part of PINKTrack.

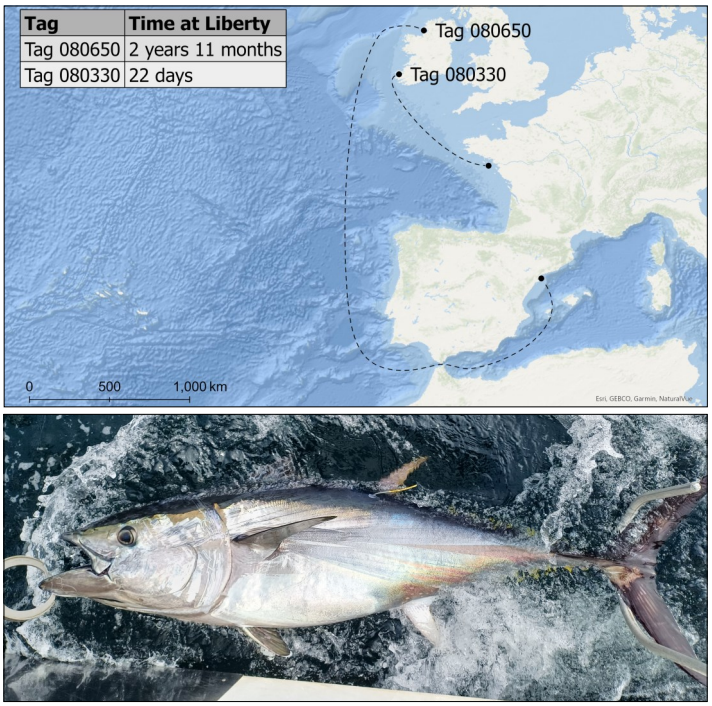
Conor McCormick taking water samples for the eDNA analysis

Contrary to expectations, only one confirmed report of the species was recorded in Ireland in 2023, in late June on the River Moy. The factors behind the relatively reduced numbers observed in Ireland and the UK in 2023 compared with other odd years since 2017 are currently unclear; in contrast, Norway has reported record numbers, with pink salmon now outnumbering native Atlantic salmon in some northern Norwegian rivers. eDNA surveillance will therefore provide a valuable insight into whether angler catch provided a good indication of the distribution of pink salmon in Ireland in 2023. Sincere thanks are expressed to the many IFI Operations staff who supported the sample collection.

Tuna CHART 2023: First Recaptures of Tagged Bluefin Reported

Since 2019, the Tuna CHART project has worked with authorised charter skippers around Ireland to tag bluefin tuna. The skippers use approved angling gear and handling methods to hold captured fish alongside to aid their recovery while measuring their length and attaching a floy tag so that they can be identified if recaptured. In 2023, 380 bluefin were tagged, predominately in Donegal Bay, which is the hotspot for the species' occurrence in Irish waters.

This mark–recapture protocol has come to fruition in 2023 with the first recaptures of tagged bluefin reported from the 1,880 fish tagged so far. Fish "080650" was recaptured off northeast Spain's Mediterranean coast almost three years after it was first caught in Donegal Bay. In contrast, fish "080330" had a much shorter time at liberty and was recaptured off the coast of France, covering a minimum distance of about 760 km in just 22 days after it was first caught off the coast of Kerry. These recaptures are important first results in a project that will ultimately provide insights into the range and survival of this magnificent trophy fish.



Map: Tuna CHART recaptures. Image: Floy-tagged bluefin (c/o Adrian Molloy)

International Research to Study the Life of Atlantic Salmon in Greenland's Icy Waters

Glen Wightman at work for SMOLTrack in Greenland

Atlantic salmon are famed for their epic migration from rivers around Europe northwards to where the cold waters of the Arctic Ocean meet the North Atlantic Ocean, where they range over a vast area of ocean foraging for prey before returning to their natal rivers to spawn. The survival of salmon as they mature into adulthood and migrate through these remote waters is a key question in salmon conservation. Marine mortality is thought to be a significant factor in the decline of salmon numbers returning to rivers over recent decades, but detailed information on the life of salmon at sea is scarce.

In September, Glen Wightman of IFI Research undertook his own epic journey to Greenland to join Kim Aarestrup and Niels Jepsen from the Technical University of Denmark as part of SMOLTrack, an EU-funded programme coordinated by the North Atlantic Salmon Conservation Organisation (NASCO). Glen and his colleagues travelled to Kuummiut, a remote settlement of 248 people located amongst the fjords of southeastern Greenland. The team took samples provided by local fishermen to investigate the genetic origin, age, growth and diet of salmon in their feeding grounds, finding that they were feeding primarily on small forage fish, such as sandeels and capelin, as well as crustaceans and squid.

A key goal was to develop a protocol to capture and tag salmon at their feeding grounds off the coast of Greenland. Salmon were captured by rod and line and surgically implanted with data storage transmitters, which record ambient environmental data during their return to rivers in Europe. The team hope that the methodology and logistics developed by this pilot study will establish a tagging programme for salmon captured in Greenland's coastal waters. The long-term goal is to capture salmon, identify individuals from key European rivers using genetic analysis, then tag-and-release them with fit-for-purpose tags (pop-off satellite, acoustic or data storage) to gain insights on their feeding behaviour and return migration.

The SMOLTrack project aims to use these tracking devices to reveal more data on the return migration of Atlantic salmon from Greenland to Europe and to provide insights into the survival of salmon at sea. Filling these significant knowledge gaps on the oceanic migration of Atlantic salmon will help us understand how many of them will survive their return journey to Ireland's rivers in the future.

Icebergs: a hazard to fieldwork in Greenland's coastal waters

Kuummiut

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We Hope You Enjoyed the Newsletter

Feedback is always welcome, so please get in touch if you have any comments.
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