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lascach Intíre Éireann Inland Fisheries Ireland

Welcome to the Newsletter

This issue of the newsletter marks an opportunity to provide updates on IFI Research projects initiated in 2019 that are now up-and-running for 2020: the Climate Change Mitigation Research Programme, Currane STAMP and the Irish Marine Recreational Fishery Survey.

The items on sea trout in Lough Currane, surveying sea anglers and salmon red skin disease highlight how citizen science and information about anglers' catches can help conservation science for Ireland's fisheries resources. 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

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Fisheries Science in the Digital Age — Developing Research Partnerships & Citizen Science



Hyder, Christian Skov, Paul Venturelli & Ciara O'Leary

Fisheries science is data hungry: fish survive and thrive in communities of species in habitats ranging from tiny streams to the open ocean, in which multiple environmental pressures influence their life history and ecological interactions—data that perfectly captures these dynamics on every stretch of water for modelling, assessment and management are hard to come by. IFI Research is now developing partnerships internationally to explore expert advice on new opportunities for science created by the digital revolution and locally with anglers to gather the information needed to conserve and manage Ireland's fish.

In January, IFI Research held a workshop at IFI Citywest that explored how developments in digital technology and social media can be harnessed for citizen science in fisheries research. The project was organised on behalf of



Paul Venturelli and Ciara O'Leary preparing for workshop talks

the European Inland Fisheries and Aquaculture Advisory Commission (EIFAAC), which promotes the sustainable development, conservation and management of Europe's inland fisheries and aquaculture by coordinating research and communication. Cathal Gallagher and Fiona Kelly of IFI Research serve on EIFAAC's management and technical & scientific committees, respectively.

The visiting experts also gave engaging talks to IFI staff. Paul Venturelli of Ball State University discussed apps for anglers to record their catch as a source of fisheries data, such as the angler diaries developed by Christian Skov of Denmark's National Institute of Aquatic Resources. Kieran Hyder of the UK's Centre for Environment, Fisheries and Aquaculture Science described the status and challenges facing Europe's marine recreational fisheries and the relationship between citizen science by anglers and fisheries policy.

Both talks highlighted the importance of establishing the benefits of participation for anglers. Citizen science allows anglers to contribute towards stewardship of their resource, raises awareness of the status of fish stocks and encourages collaboration between agencies and stakeholders. Data gathered digitally by citizen-scientist anglers over wide geographic areas allows fisheries scientists to overcome limitations in data collection. Ultimately, fish are the biggest winners: this co-operative approach leads to more data for management decisions and better conservation outcomes.



Citizen science in action: a seabass measured & tagged by angler

New IFI Research Publication — IFISH Launches with Scale Reading Manual

In November, IFI Research launched a new publication called *IFISH - Fish & Habitats: Science and Management. IFISH* is designed to bridge the gap between peer-reviewed scientific articles and 'grey' literature, i.e., reports and reference material compiled by IFI staff that contain useful information but that may not be easily accessible or suitable for publication elsewhere. *IFISH* will have a broad remit, publishing content on fisheries biology, biogeography, ecology, environment and management. Issues will be submitted with an ISSN to the National Library of Ireland and made available in electronic format on the IFI website.

The first issue, "Manual for Ageing Common Freshwater Fish Species in Ireland", was written by John Coyne and colleagues of IFI Research, with Robert Rosell of AFBI as guest editor. John and colleagues describe the methods used in scale reading: at high magnification, fish scales have increments called circuli that are deposited as fish grow, thereby providing a means to determine fish age and growth rates. A particularly useful feature of the scale manual is a collection of over 60 plates illustrating example scales from twelve fish found in freshwater in Ireland.

Climate Change Mitigation Research Programme (CCMRP) Update

Climate change has been identified as one of the greatest threats to Ireland's fish populations, and there is considerable concern that many rivers and lakes will become less suitable for native species. Over the last few years, scientific articles by IFI Research staff have documented impacts of climate change on river habitat, ecological interactions in lake fish communities and salmonids that prefer colder water, such as Arctic char, trout and salmon. Projected changes in the frequency and intensity of extreme weather events are likely to lead to high water temperatures, droughts and floods that could potentially change the behaviour, ecology and distribution of fish.

The Climate Change Mitigation Research Programme (CCMRP) is underway at IFI Research to bridge knowledge gaps related to climate change impacts on Ireland's fish species. Initially, a GIS study identified index catchments with representative landscape and environmental



CCMRP weather sensor array at the Erriff



From the first issue: an illustration of salmon scale terminology



IFISH launch: Cathal Gallagher, Lynda Connor, John Coyne, Robert Rossell & Fiona Kelly

variables around the country. The CCMRP team then deployed water temperature data loggers in selected rivers in the east, northwest and west; further catchments in the south and Midlands will be monitored in the future. At the Erriff, IFI's National Salmonid Index Catchment, the team has set up a weather sensor array with a webstream available at https://tinyurl.com/ccmrp-erriff-nsic. The team will also assess variation in river flows in relevant catchments.

The CCRMP aims to use this data to model the factors controlling water temperature in rivers and lakes. Risk assessment will be carried out for key fish species and habitats to identify vulnerable areas in catchments, and GIS tools will be used to identify priority areas for mitigation. This evidence-based approach will allow the assessment of mitigation strategies for fisheries conservation and protection. Please visit https://youtu.be/8oCL2_g08fc to watch a video overview of climate change research at IFI.



John Coyne (CCMRP) deploying a data logger, Gweebarra catchment

Currane STAMP — Lough Currane Sea Trout Assessment & Monitoring Programme

Lough Currane in Kerry is famed for the quality of its sea trout fishery, with many specimen fish over 4.5kg recorded annually. In recent years, however, anglers have expressed concerns about declines in sea trout catches. A new IFI Research project will establish the conservation status of Lough Currane's sea trout population.

Currane STAMP will use electrofishing surveys to map spawning and nursery habitat in rivers around Lough Currane to assess juvenile population trends. Acoustic tracking will be used to monitor the movements of sea trout from river to sea and back again to uncover their migratory routes and determine their survival in the marine environment.



Sea angling is one of the most popular sectors of Ireland's recreational fisheries resource and is estimated to be enjoyed by about 127,000 people each year, generating €230 million expenditure for the Irish economy (IFI, 2015). Nonetheless, there is limited information available on how often people go sea angling, how many fish they catch and how many fish they release. In 2020, IFI Research will establish the Irish Marine Recreational Fishery Survey (IMREC) to quantify sea angling in Ireland.

The establishment of IMREC is driven by the requirements of the EU Data Collection Framework for fisheries management. The framework requires member states to collect data on recreational angling catches and releases of commercially important or any protected fish species managed on a multi-annual basis across Europe.

Surveying fishing trips by shore anglers and by charter or private boats around Ireland's 3,000 km plus coastline will be challenging. The IMREC team is designing a sampling protocol to survey Ireland's sea anglers at shore marks and boat access sites, with the goal of gathering data on anglers' fishing effort and species targeted through interviews and creel surveys. The team is also investigating novel alternatives to traditional fisheries methods, such as remote sensing, citizen science and social media research.



Many IFI Research programmes now incorporate citizen science, establishing partnerships with anglers to apply their skills and knowledge to answer key questions in fisheries research. Currane STAMP will continue this trend, using the records of sea-trout anglers to establish current and historical trends in rod catch.

Currane STAMP is funded by the Salmon and Sea Trout Rehabilitation, Conservation and Protection Fund. Met Éireann is also providing generous support for the project: Ryan Murray of IFI Research is based at the Valentia Observatory in Cahersiveen, from where he works with the support of IFI regional staff.

The Irish Marine Recreational Fishery Survey — How Many Sea Anglers Are Out There?

Ultimately, the information gathered by IMREC will help to inform management strategies to ensure that sea anglers in Ireland continue to enjoy sustainable recreational fisheries for their favourite marine fish species.



Sea anglers: how many are out there, and what do they catch?



The challenge: surveying marks and boat access along the coast

Red Skin Disease Outbreak 2019 — An Emerging Threat to Ireland's Atlantic Salmon?

In June 2019, small numbers of Atlantic salmon returning to Irish rivers were observed with signs of bleeding and red, rash-like ulcers on their skin. Similar symptoms were observed affecting salmon in Scottish and Norwegian rivers as well. In response to this mysterious outbreak, IFI is working to identify the disease and monitoring salmon for any new incidence in 2020.



After red skin disease emerged, IFI set up a dedicated email address—salmonhealth@fisheriesireland.ie—for anglers and other stakeholders to report affected salmon. In 2019, 56 salmon were reported from 17 rivers in Ireland. Most instances occurred between in June and July. At the Galway Fishery on the River Corrib, where on-site regional IFI staff routinely maintain a high level of monitoring, 3.5% of salmon caught were affected.

The pathological cause of this disease currently remains a mystery. IFI worked with the Fish Health Unit in the Marine Institute to obtain samples from affected fish, but so far, virological, bacterial, histological and genetic tests have not identified a known salmon pathogen or parasite. At a workshop in Oslo last November, Mick Millane of IFI Research met with colleagues from other research



No. of red skin disease cases reported per week, Apr-Sep 2019

agencies around Europe to discuss the disease and coordinate the international response to it. Other potential causes, such as vitamin deficiency, have been hypothesised, but not yet confirmed.



Map of Irish catchments with red skin disease detected, 2019

As well as red skin disease, there are other potential threats the health of Ireland's wild salmon. Ireland is fortunate to so far remain free of the salmon fluke *Gyrodactylus salaris*, which has spread through Europe from the Baltic region; however, red vent syndrome, which is associated with *Anisakis* nematode worms, is known to occur in adult salmon returning to Ireland. The IFI Research project LiceTRACK has also investigated infection of wild salmon by sea lice in proximity to marine salmon farms.

Please see the text box below for information on identifying and reporting red skin disease.

Re	porting	g Susp	ecte	ed	Red	Skin Disease	e
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Signs that a salmon may be affected by red skin disease:

- Bleeding
- Ulceration of the skin
- Mainly affects the belly of the fish

Have you seen these signs? If so, please:

- Record relevant information:
- > Precise location and river system
- > Take photographs
- Contact us:
- Email: salmonhealth@fisheriesireland.ie
- > Phone IFI's 24-hour hotline 1890 FISH 24: 1890 3474 24



Inland Fisheries Ireland

We Hope You Enjoyed the Newsletter

Feedback is always welcome, so please get in touch if you have any comments. Contact Rory Feeney at 01 8842636 or <Rory.Feeney@fisheriesireland.ie> Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin D24 Y265 http://www.fisheriesireland.ie/Research-and-Development/fisheries-research.html IFI Research social media

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