Developments in Inland Fisheries Ireland Research

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Iascach Intíre Éireann
Inland Fisheries Ireland

Welcome to the Newsletter

International cooperation is important for research on the evolving impacts of climate change on inland fisheries, and this April, the IFI R&D Division was proud to facilitate a workshop that provided a platform for leading experts to share their key findings on this challenging issue.

This newsletter also provides progress updates from two of our newer projects at the IFI R&D Division: the DiadSea project on diadromous fish conservation, and the EPA RESTORE project on protecting Ireland's most pristine rivers.

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

EIFAAC Workshop on the Impacts of Climate Change on Inland Fisheries

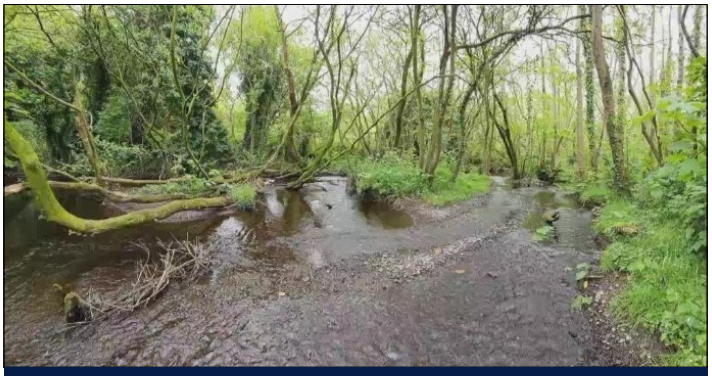
On April 8th, the IFI R&D Division hosted an online workshop on the impact of climate change on inland fisheries on behalf of the European Inland Fisheries and Aquaculture Advisory Commission (EIFAAC). The meeting commenced with an introduction to IFI's climate research by Cathal Gallagher, who serves as the chair of EIFAAC. Attended by 166 online participants, the workshop featured presentations from 11 experts from across Europe and North America, including IFI R&D Division researchers speaking from IFI Citywest HQ.

Climate research now helps IFI to use adaptive management to protect fish from extreme weather events. Aoife Walsh of the Office of Public Works Climate Resilience Programme (OPWCRP) described IFI's Warm Water Protocol, which uses best available evidence on thermal thresholds for stress and mortality for brown trout and Atlantic salmon. In this standard operating procedure, daily spot checks of water temperature are used in a decision tree to help fisheries managers decide when to close fisheries to relieve fish from potentially lethal stress during heatwaves. This 'traffic-light system' also provides for reopening of fisheries as rivers cool down again.

Restoring natural features to rivers can protect sensitive species from the impacts of climate. Rossa O'Briain of the Hydromorphology Research Programme described how a riverscape can be conceptualised as 'beads on a string', in which narrow channels connect wider segments that act as retention zones for water, sediment and nutrients. These wider 'beads' provide local biodiversity hotspots that also function as a refuge for fish during extreme flow and temperature events, such as heatwaves, droughts or flooding, by providing more complex river habitat with slower flowing, deeper, cooler waters. IFI is now conducting applied research on techniques to reinstate these features in rivers, for example, through strategic placement of large wood at appropriate locations.

The workshop closed with an interesting overview of the challenges in building resilience to climate change from Ian Cowx, emeritus professor at the University of Hull, who noted that the needs of natural capital and socioeconomic capital related to water resources must be balanced. The workshop brought into focus future directions for research and evidence-based adaptation strategies to help protect vulnerable fish in projected future climate scenarios. For updates on the workshop's outputs, please visit https://tinyurl.com/ycydz8tp.

Climate research helps protect sensitive salmonid species from heatwaves



An example of a river 'bead' and associated complex habitat

DiadSea — Advancing Conservation of Migratory Diadromous Fish

Twaite shad: a diadromous fish popular amongst specimen-hunting anglers

DiadSea outreach: Tony Brett giving a talk on diadromous fish

The DiadSea team at IFI's R&D Division is now gathering the information we need to take better care of diadromous fish. Diadromous fish migrate between the sea and freshwater in their complex life cycles. Many of these species, such as salmon, shads and mullets, are well known to anglers, and they support ecosystem services for local communities along rivers and estuaries on their migration routes. Their migratory lifestyle, however, makes it challenging to take effective action to conserve them, especially in marine waters, where their distribution is difficult to study and not well understood.

DiadSea is a EU-funded INTERREG Atlantic Area project in which partner organisations in Portugal, Spain, France and Ireland are assessing knowledge gaps about diadromous fish at sea. The project anticipates that the geographic distribution of these species will shift in response to climate and oceanographic change, and the partner organisations are working together to improve transnational cooperation on the conservation of diadromous fish in the future.

So far, the DiadSea team at IFI's R&D Division have been compiling available data on diadromous species distribution for spatial modelling, which will be used to map priority areas for conservation and to update an interactive web atlas. A first priority for the team was to create an identification booklet to help researchers and commercial fishermen working at sea to report captures of diadromous fish.

The DiadSea project has a busy schedule planned for 2025, with eDNA sampling for diadromous species in the Waterford Harbour and Munster Blackwater estuaries, as well as anglers surveys and harbour visits to commercial fishermen to gather information. The project partners are also working on genetic and microchemistry studies of sea trout and shad.

The DiadSea project aims to increase awareness about diadromous fish and about their socioeconomic and cultural benefits for local communities, and so a key part of the project are outreach events, such as talks and workshops. Ultimately, the project hopes to create a 'fish observatory'—an information network of stakeholders working together to take care of diadromous fish and to protect their habitats. Further information on the DiadSea project can be found at www.fisheriesireland.ie/what-we-do/research/diadsea.

Commercial fisheries: data source on marine distribution of diadromous fish

New Digital Book on Ireland's Lakes

"Lakes in Ireland — Mirrors of Change" is a new digital book now available at https://oar.marine.ie/handle/10793/1973 to download for free. The book provides detailed research and expert insights for everyone with an interest in the ecological, cultural, and environmental importance of Ireland's lakes.

The book features contributions from several IFI staff, including Fiona Kelly, Seán Kelly and Paul McLoone of the R&D Division and Shane O'Reilly of the Business & Development Division, as well as photography from Daniel Cierpial of the R&D Division showcasing the beauty of Ireland's lakes.

IFI's EPA RESTORE Project — Working to Help Protect Ireland's Pristine Rivers

Nymph of *Perla bipunctata*, a stonefly that lives in clean, fast-flowing rivers

EPA RESTORE and Waters of LIFE meeting, IFI Citywest

Good water quality in rivers is an essential ecosystem service, providing habitat for aquatic life, as well as a source of clean water for local communities. These benefits are threatened by significant pressures, however, and around 33% of Ireland's river waterbodies are now at risk of not maintaining good ecological status as mandated by the Water Framework Directive. The EPA RESTORE team at IFI's R&D Division are making progress in their mission to help protect and restore Ireland's most pristine rivers.

The EPA RESTORE project is part of Waters of LIFE, an EU LIFE programme that aims to prevent and reverse the loss of Ireland's high status objective waterbodies. These are rivers with high water quality, relatively undisturbed catchments and channels with natural hydromorphology, and they are still capable of providing the clean, unpolluted freshwater habitats required by sensitive aquatic species.

The EPA RESTORE team are monitoring water quality and biodiversity in six catchments chosen to assess how to best protect rivers with high ecological status. So far, the project has completed a baseline assessment of water quality in the catchments using macroinvertebrate samples. The next phase will involve high-frequency biological, physicochemical and hydromorphological sampling to track the impact of measures to mitigate agricultural and forestry activities.

Cooperation and knowledge transfer are key elements of any multi-agency research programme, and in February, the EPA RESTORE team met with project partners at IFI Citywest to plan a targeted approach to active monitoring of the study catchments. The EPA RESTORE team is also working with IFI's National Research Surveillance Programme Rivers team to track changes in the ecological status of fish communities in the study catchments' rivers where possible.

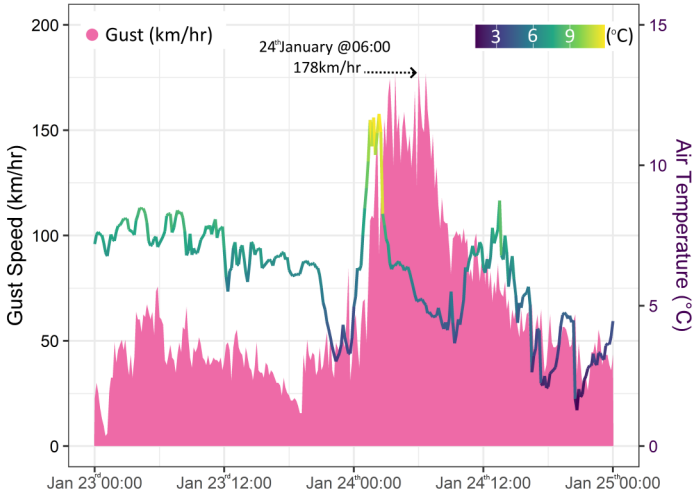
Read more about the EPA RESTORE project at www.fisheriesireland.ie/what-we-do/research/epa-restore-project.

Luggala Stream, a tributary of the Avonmore catchment, County Wicklow

Storm Éowyn — CCMRP Weather Station Data on Record-Breaking Extreme Weather Event

A primary objective for scientists working in field-based experiments is data recovery. The value of robust, offline, low-cost equipment was never more proven than when a Climate Change Mitigation Research Programme weather station in the River Erriff National Salmonid Index Catchment survived Storm Éowyn's rampage through the western seaboard on January 24th, 2025.

From 1:20 a.m. to 2:10 a.m., air temperatures doubled from 6°C to 12°C as the extratropical cyclone hit Ireland. Within minutes, winds rose to gust speeds averaging 151 km/hr until 7:40 a.m. A maximum gust of 178 km/hr was recorded at 6:00 a.m., very close to the Ireland's new provisional record of 183 km/hr recorded at Mace Head, County Galway, that morning.



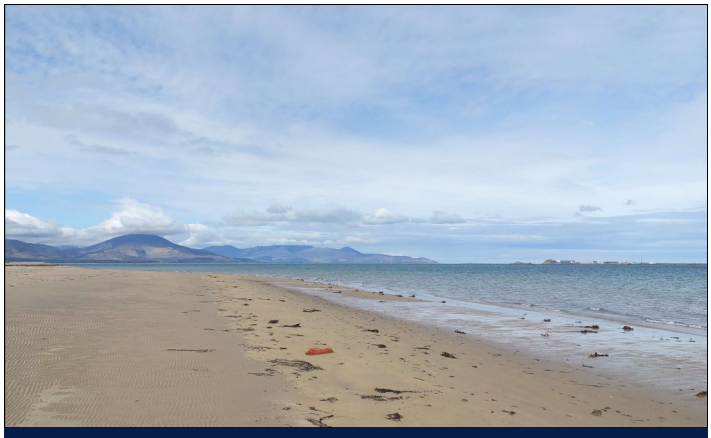
Lovely & Fair as the Rays of Tralee — Conservation Status of the Undulate Ray

The undulate ray (*Raja undulata*) is a beautifully patterned fish, with distinctive dark, wavy bands and white spots on its back. This camouflages undulate rays against muddy and sandy seabeds, where they hunt as ambush predators of bottom-dwelling fish and crustaceans. Like other benthic fish inhabiting shallow inshore waters, one of the risks for undulate rays is mortality due to entanglement in trammel nets set by commercial fisheries. The species is now classified as near-threatened globally by the IUCN and as endangered in Ireland's Red List for threatened elasmobranchs (sharks, skates & rays). IFI's Marine Sportfish Tagging Programme (MSTP) is gathering data that will help to protect this vulnerable species.

Undulate ray on a measuring mat

Since 1970, the MSTP has worked with sea anglers and charter skippers to promote catch-and-release of elasmobranchs and other sportfish around the Irish coast for tagging studies, with 49,533 elasmobranchs spanning 24 species tagged to date. Up to last year, 1,216 undulate ray have been tagged, with 98% recorded at Tralee Bay, County Kerry, which is widely known as a hotspot where undulates and other species of ray may be occasionally caught. Of the 55 recaptured undulates, all recaptures were along the west coast, and 89% were from Tralee Bay.

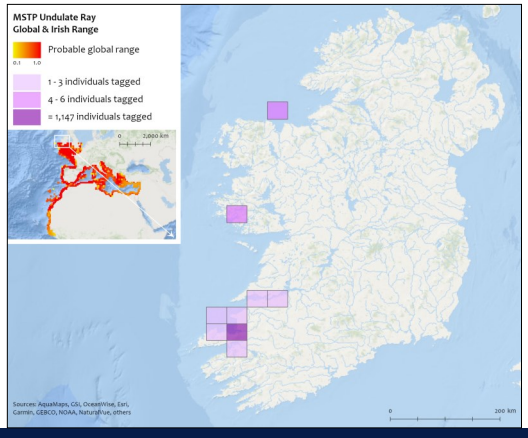
Angling statistics show that numbers of tagged undulate ray have declined in recent years, but there is not enough data on this uncommon fish to fully interpret this trend with certainty. Fortunately, the undulate ray is a relatively fecund elasmobranch, laying up to 70 eggs per year in batches from May to September. After the young hatch, the empty eggcases can sometimes be found washed up on the shore as mermaids' purses.


Tralee Bay: a sandy hotspot for undulate ray in Ireland

The fidelity of undulate rays to their favourite sites, with little or no mixing between populations across their range, means that Tralee Bay shelters a population that is internationally important for this species. Populations of undulate ray may be locally common but are dispersed in a patchy distribution along the North Atlantic and Mediterranean coasts of Europe and Africa, with Ireland at the northern edge of its range.

Tagging data compiled over decades by the MSTP is now contributing to the ongoing process of strengthening marine conservation in Ireland and assessing the conservation potential of marine protected areas for vulnerable fish species like undulate ray. IFI encourages all sea anglers to catch-&-release elasmobranchs using good handling techniques to help protect these vulnerable fish.

MSTP data on undulate rays and other marine sportfish can be explored on IFI's Open Data Portal at https://arcg.is/TnWHn.



Site fidelity: 98% of taggings & 89% of recaptures are in Tralee Bay

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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
https://www.fisheriesireland.ie/what-we-do/research

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