



## Welcome to the Newsletter

Summer 2017 has brought some welcome sunshine so far, and IFI's R&D and RBD staff around the country are currently working on field surveys, such as the Catchment-Wide Electro-Fishing programme.

In this issue, we feature the Marine Sport Fish Tagging Programme and its work on sharks. This issue also highlights how IFI researchers contribute to international cooperation to protect fish species through our work with the International Council for the Exploration of the Seas (ICES).

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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## Tracking Ireland's Sharks—IFI's Marine Sport Fish Tagging Programme



Tagged blue shark: when and where will we see her again?

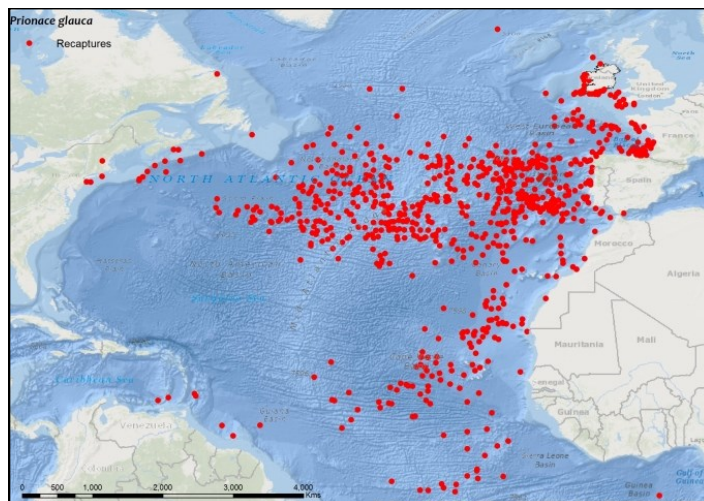
Sharks are the biggest, most powerful fish enjoyed by anglers in Irish waters. Yet these top predators are surprisingly vulnerable. With life histories that feature oceanic migrations and low rates of population growth, many shark species are under threat from commercial fisheries around the world, either from overexploitation or as by-catch.

Sharks are cartilaginous fish, a group that includes skates, rays and more exotic deep-sea fish known as chimeras. Last year, cartilaginous fish were the subject of a Red List: an assessment of species' extinction risk based on known data about their populations and geographic range. Irish waters contain 71 species of cartilaginous fish, and the NPWS-led [Red List](#) identified Ireland as a refuge for some of the six species classified as critically endangered, including porbeagle shark, angel shark and three species of skate.

An invaluable data source on Ireland's sharks is IFI's Marine Sport Fish Tagging (MSFT) Programme—one of the longest running of its kind in the world. Coordinated by Willie Roche and Shane O'Reilly of IFI, the MSFT programme is indebted to the voluntary efforts of charter boat skippers who have attached plastic tags to the fins of sharks, skates and rays caught by anglers since the mid-1970s. IFI has compiled reports of recaptures of tagged fish by anglers and commercial fishermen, amassing a massive dataset of almost 40,000 records for 15 species.

Tagging of blue sharks, one of our most prized sport fish, has yielded some [striking results](#). One blue shark tagged in Irish waters was recaptured only 274 days later off the coast of West Africa after an estimated cruise of 6,840km; another was recaptured 17 years after it was tagged. These results highlight the challenges for conservation of long-lived, highly mobile fish species. IFI helps international efforts to protect marine and migratory fish by contributing data and expertise to organisations such as ICES.

IFI promotes [catch-and-release](#) and good fish handling by anglers to [help conserve sharks, skates and rays](#). Visit <https://goo.gl/SVX5Gg> to check out our tagging webpage.



A true ocean wanderer: blue shark recaptures

### Want to report a tagged shark/skate/ray? Please do!

- Record as much information as possible:
  - Tag number
  - Precise recapture location (GPS co-ordinates if possible)
  - Length & weight (estimate if necessary)
  - Date, time & method of recapture
- Contact us: Shane O' Reilly <[shane.oreilly@fisheriesireland.ie](mailto:shane.oreilly@fisheriesireland.ie)>
- For more information, please visit our [tagging webpage](#).

## Sea Lice from Salmon Farms: Their Impact on Wild Salmon Returns

Ireland's emblematic Atlantic salmon are under threat. Since the 1970s, wild salmon populations have declined, apparently due to increased mortality when they migrate to sea, and there are concerns that this decline is driven by climate change. Growing evidence indicates that infectious disease and escapees from salmon farms might also affect wild salmon's struggle to survive in the marine environment. New research by Sam Shephard and Paddy Gargan of IFI now quantifies the impact of sea lice associated with salmon farms on a wild salmon population.

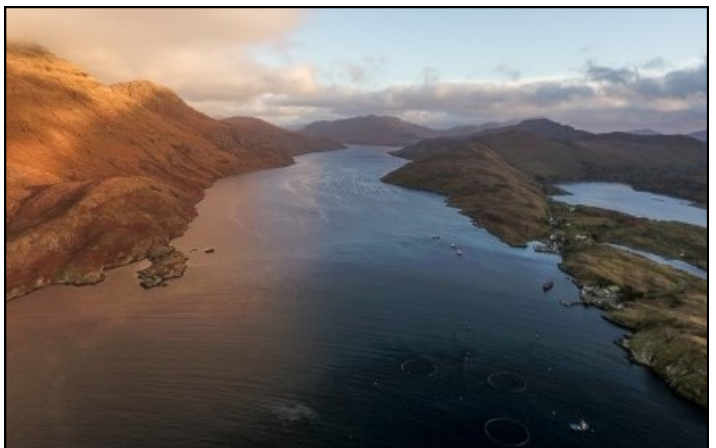
Wild salmon migrating to and from the River Erriff over their lifetime must pass salmon aquaculture sites in Killary Harbour. On May 5th in [Aquaculture Environment Interactions](#), Sam and Paddy reported a time-series analysis of 30 years of data on returns of wild salmon from the River Erriff that had spent a winter at sea (1SW salmon). The salmon return data was compared with counts of sea lice at the aquaculture sites in the previous year, when those fish were migrating past the farms to sea as smolts.



Juvenile sea lice on the head of a sea-trout smolt

Statistical modelling that accounted for natural year-to-year variation in salmon returns showed that the returning run of 1SW salmon was reduced by about 50% following years when lice levels at the salmon farms were high. Modelling of stock recruitment showed that without the observed impact of sea lice from aquaculture, annual returns of 1SW salmon to the Erriff might potentially have been twice as large but nevertheless would probably still show a long-term decline.

This study clearly demonstrates that infestation with sea lice from salmon farms can cause significant losses in a wild salmon population. This impact from salmon farming has serious long-term implications for the viability of wild salmon populations which are possibly already under pressure in response to global warming and the impact of rising sea surface temperatures on marine food chains. Sam and Paddy's study concludes that if the marine survival of wild salmon continues to decline, the impact of sea lice on migrating smolts could prove critical.



Killary Harbour with salmon farm in foreground (bottom right)

## Conference on Trout Genetics

The R&D Division is delighted to announce a conference on the genetics of Ireland's brown trout populations. **"Understanding Brown Trout – Genes, Ecology and Citizen Science"** will take place on Tuesday 17th October in the Hodson Bay Hotel on the shores of Lough Ree near Athlone.

The conference will feature international guest speakers and will present trout genetics research carried out by IFI in partnership with Queen's University Belfast. An invaluable contribution to this research was made by citizen scientists: anglers who collected scale samples for genetic analysis.

Further details of the conference will be published on our website in late July/August. For enquiries, please contact [Shima Mistry](#) (01 884 2612). Visit <https://goo.gl/Pibhw6> to read about brown trout genetics research on our website.

## Supporting Future Fisheries Researchers

IFI has donated spare laboratory glassware from its water chemistry programme to University College Dublin (UCD) as part of its Memorandum of Understanding with the university. The donation strengthens a research partnership in which IFI and UCD have worked together on aquatic ecology and fish stock genetics, providing students with valuable experience working in applied science.

Associate Professor Mary Kelly-Quinn of UCD's School of Biology and Environmental Science says this generous donation of laboratory glassware will benefit students enormously. Cathal Gallagher, Head of IFI's R&D Division, says this is another example of the vital role IFI are playing in supporting the development and education of the next generation of scientists into whose hands the future of the fisheries resource will be placed.

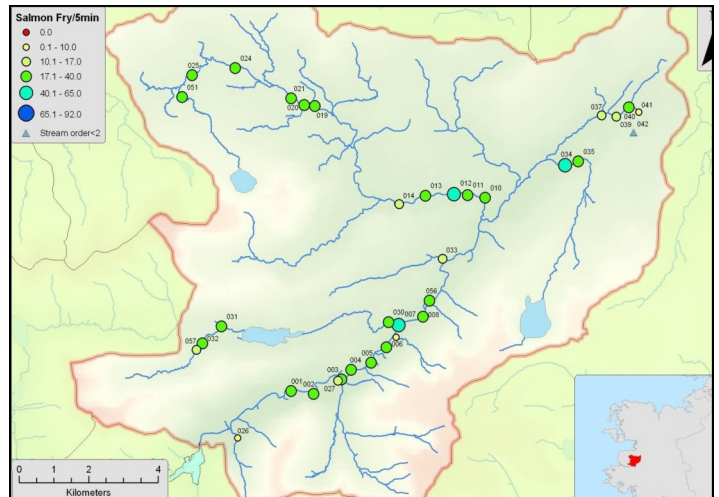
## Catchment-Wide Electro-Fishing (CWEF) Programme

The Standing Scientific Committee on Salmon (SSCS) is a multi-agency group of salmon experts chaired by Paddy Gargan of IFI that annually reviews data on salmon populations to determine whether each salmon river is attaining its conservation limit (CL)—a minimum number of adults required to spawn in a river each year to conserve its stocks. If the CL is not attained, the river must be closed to harvesting by anglers and commercial fisheries to allow stocks to recover.

A key index for CL attainment is provided by the CWEF programme. These five-minute electrofishing surveys are carried out in gravelly riffles in shallow streams—the preferred habitat of salmon fry. The protocol allows many sites to be surveyed rapidly, building a picture of juvenile salmon populations over entire catchments; in 2014, RBD staff surveyed 1,048 sites in 38 catchments. The results provide a relative index of juvenile abundance: currently, at least 17 juvenile salmon fry per five minutes is considered to indicate that a site is achieving its CL.



Juvenile salmon caught in CWEF survey



Example of CWEF catchment survey (Erriff River 2014)

The CWEF surveys have benefits beyond simply providing data for determining salmon CLs. The surveys provide an opportunity to carry out fundamental research into the ecology of salmon in Irish rivers. They also identify potential management issues, such as water quality, barriers to migration or habitat loss.

The CWEF programme is coordinated by Tony Holmes and funded by the Salmon Conservation Fund, which is generated from the sale of salmon angling and commercial fishing licenses for reinvestment in conservation of salmon stocks and habitat. This year, CWEF surveys are scheduled to take place in 40 river catchments. The CWEF programme relies on the excellent contribution of IFI's RBD staff who carry out the surveys.

Visit <https://goo.gl/ci1JnG> to read more about IFI's salmon management programme and to access SSCS reports.

## Invasive Alert: Pink Salmon

IFI is asking the public to [look out for pink salmon](#), also known as humpback salmon (*Oncorhynchus gorbuscha*). Native to river systems flowing into the North Pacific and Arctic Oceans, pink salmon have established populations in Norway and northwest Russia, and this migratory species occasionally strays westwards.

So far this summer, anglers have caught pink salmon in the Corrib, Drowes and Moy fisheries.

### Have You Seen A Pink Salmon?

- Record as much information as possible:
  - Date & location of capture
  - Length & weight of the fish
  - Take a photograph
  - Retain the fish for inspection by IFI staff if possible
- Contact us: Paddy Gargan <[Paddy.Gargan@fisheriesireland.ie](mailto:Paddy.Gargan@fisheriesireland.ie)>

Pink salmon differ from Atlantic salmon in following ways:

- Large black oval spots on the tail
- Anal fin has 11-19 rays (Atlantic salmon have 7-11)
- Much smaller scales than similar-sized Atlantic salmon
- No dark spots on the gill covers
- Upper jaw typically extends beyond eye



Pink salmon caught in Galway, June 27th

## IFI's Work with the International Council for the Exploration of the Sea (ICES)

ICES is an international science organization that aims to advance scientific understanding of marine ecosystems and to promote sustainable use of the seas. Established in 1902, ICES now has 20 member countries, with a secretariat based in Denmark. The work of ICES is coordinated by committees that oversee scientific work and that issue advice for maritime and fishing industries, governments and international fisheries conservation commissions.

The core work of ICES is accomplished through working groups, in which participating experts work together on diverse topics in marine science and fisheries management. The working groups meet regularly, and members share information and complete assigned tasks to prepare scientific advice and to issue reports.



ICES experts: 1904 versus 2017 (source photos: ICES)

As members of working groups (see box), IFI researchers contribute data on Ireland's fish stocks. ICES also advances methods of stock assessment. As a member of WGTRUTTA and co-chair of WGEF, Sam Shephard of IFI is involved in developing population modelling and biological references for sea trout as well as exploring methods to assess skate, dogfish, smooth-hound and tope stocks for which data is poor.

ICES also holds workshops to establish the latest scientific understanding of more specific issues. So far this year, IFI has been represented by Mick Millane at [WKCCISAL](#), which explored the impacts of climate change on Atlantic salmon, and by Ciara O'Leary at [WKEELDATA](#), which organised better standards for reporting data on the European eel.

This issue's stories on sharks and salmon illustrate how Ireland's fish populations face challenges that extend far beyond our shores. Participating in organisations like ICES provides IFI with an opportunity to contribute to the international scientific community's work on fish conservation.

### IFI Members of ICES Working Groups

- WGDAM** Working Group on Data-Poor Diadromous Fish reports on under-researched migratory fish, e.g. shad, lamprey (J. King, F. Kelly, P. Gargan, M. Millane, W. Roche)
- WGEEL** Working Group on Eels monitors the state of European eel stocks (Ciara O'Leary)
- WGEF** Working Group on Elasmobranch Fishes assesses stocks of sharks, skates & rays (Sam Shephard co-chairs)
- WGNAS** Working Group on North Atlantic Salmon assesses Atlantic salmon stocks and distribution (Mick Millane)
- WGTRUTTA** Working Group to Develop Assessment Modelling & Biological References for Sea Trout (Sam Shephard)

## WFD & Barrow River Reports 2015

IFI's [wfdfish](#) website has been updated with reports on river surveys carried out in 2015 with the assistance of RBD staff. [WFD surveys](#) were conducted at 31 river sites around the country in 2015. The ecological status of fish communities was classified as high for one site, good for 11 sites, moderate for 15 sites and poor for one site.

A catchment-scale electrofishing survey sampled 35 sites on the River Barrow and 83 sites on its tributaries. The [Barrow report](#) contains analysis of the catchment's fish stocks and discusses ecological pressures that may affect them.



Boom-boat electrofishing on the Barrow



Iascach Iníre Éireann  
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](mailto: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>

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