

Fisheries Society of the British Isles Annual International Symposium

25th-29th July 2022
Nottingham Trent University, UK



Symposium Handbook

@theFSBI

@FSBI2022

#FSBI2022



Nottingham Trent
University

WILEY

FSBI 2022 has received generous support from:



WILEY

FLOW-3D[®]



**Nottingham Trent
University**

Contents

Welcome to FSBI2022	6
FSBI President's Welcome 2022	8
Nottingham Trent University (NTU)	9
History of NTU's Brackenhurst Campus	10
The Lyth Building	11
Catering and campus facilities	12
Southwell	13
Nottingham Castle Tour and Banquet in the City	14
Internet access on campus	15
Travelling to the Brackenhurst Campus	16
Delegate Parking	20
Accommodation and Campus Life	20
FSBI 2022 Committees	21
2022 Medalists	22
2022 Keynote Speakers	25
Full Programme	29
Sponsors	39
Parking Permit	42

Welcome to FSBI 2022: Fish in a Dynamic World

Dear Friends and Colleagues,

Welcome to the Fisheries Society of the British Isles 2022 Annual International Symposium, and to Nottingham Trent University's wonderful Brackenhurst campus. We are delighted to be able to host this year's Symposium on behalf of the FSBI. We originally offered to host a Symposium on the topic of *Fish in a Dynamic World* back in 2018, and we were far advanced with our plans for delivering the July 2020 symposium when – in late February 2020 – the Covid pandemic struck; we had perhaps not anticipated that the world was going to be quite so 'dynamic' as it had turned out to be...



Despite the setback, we were delighted that the Symposium topic had been so well received by the community, giving us confidence to offer the same theme for 2022, when we hoped that the pandemic would be well behind us. Well, clearly, Covid is still causing more problems than we had hoped, but we are delighted that once again the community has signaled their interest and enthusiasm for *Fish in a Dynamic World*, submitting close to 100 abstracts. We have tried to fit as many of these contributions into the programme as possible, as we are aware that – in the three years that have passed since the last in-person FSBI Symposium in Hull – many early-career researchers have had no opportunity to attend or speak at an international conference, or to engage in the vibrant academic discourse that accompanies such events. We are therefore delighted that the majority of presenters at this meeting are ECRs, and we also intentionally targeted a mix of early-career, mid-career and highly established plenary speakers in our invited speaker line-up.

After the success of last year's virtual Symposium, and understanding the continuing issues with international travel as well as the multiple economic challenges that persist, we have been keen to retain an online element to the meeting, to allow delegates to join, present and engage with the Symposium virtually. We are delighted that some have chosen to do so, and we are grateful to our NTU Confetti colleagues for facilitating the online element of this year's Symposium.

Our programme of activities begins on the afternoon of Monday 25th July, with a workshop addressing the important topic of '*How to progress towards creating an inclusive, diverse and transparent community in fish and fisheries*'. A reception on Monday evening is kindly sponsored by [Wiley](#), the publishers of the Society's [Journal of Fish Biology](#).

On Tuesday morning, NTU's Pro Vice-Chancellor (International), Professor Cillian Ryan, will formally open the Symposium, which will include 7 plenary lectures, 4 medalist talks, 50 talks, 18 speed talks and 25 posters. Contributed talks will cover a range of topics across seven scientific sessions focusing on: adaptations of fish to diverse habitats; physiological and behavioural responses to a warming world; behavioural ecology; the impacts of anthropogenic stressors on fish behaviour and ecology; the ecology of invasions, parasites and disease; population and community dynamics; and methodological approaches to analysing fish and fisheries in a dynamic world. A dedicated poster session will be held on Tuesday night, prior to a pub quiz in

the 'Brack Bar', for those keen to test their ichthyological and general knowledge. We have planned social and networking events throughout the week, including a visit to Nottingham Castle just before the conference banquet and medal awarding ceremony on Thursday night, which will be held at NTU's City Campus.

On behalf of the local organising team and NTU, we hope you will enjoy this Symposium, and the various events that we have planned, and that you enjoy a few days in the Nottinghamshire countryside. For many of us, this will be the first conference in too many years – and for some their first ever experience of an international Symposium – so we very much hope that delegates will benefit from several days of networking and social interaction with cross-disciplinary researchers that span different career stages and nationalities, in this rural heartland of England.



Iain Barber

Andrew Hirst

FSBI President's Welcome 2022

Dear Colleagues,

It is with considerable pleasure that I welcome you to Nottingham Trent University, and to the 2022 FSBI Annual International Symposium.

The FSBI is a learned society supporting research and scholarship in the fields of fish biology and fisheries science. Our membership is truly international, drawing from around 50 countries worldwide. Each year, the FSBI provides funding opportunities to its members through its PhD studentships, internships, training grants, travelling post-doctoral fellowship, travel and small project research grants. In collaboration with Wiley, the FSBI also publishes the *Journal of Fish Biology*, a leading international and peer-reviewed journal that publishes reviews, opinion pieces and papers describing empirical studies in the broad fields of fish biology and fisheries.



The FSBI also sponsors an annual international symposium covering the most important topics to the fish and fisheries research community. This year's symposium, on the theme of *Fish in a Dynamic World*, encompasses a very broad range of topics, techniques and research approaches, attempting to address one of the most important questions of our era: how have fish adapted to their diverse and dynamic habitats, and how will our fish populations respond to rapid environmental change?

This 2022 symposium will be the first FSBI meeting at which we have been able to meet in person for 3 years. Many of us (myself included) have missed the opportunity for informal interaction with like-minded enthusiasts that sparks new ideas, allows for the sharing of methods and approaches, and injects renewed enthusiasm into our research, as we realise that we are not the only ones that find our research fascinating. Despite some advantages on online meetings, these are benefits that are largely missing from a conference conducted wholly on Zoom.

I am extremely grateful to Iain Barber and Andrew Hirst from NTU who are convening this year's symposium, to their local organising team and members of their scientific committee. The programme that the organisers have put together for this meeting is outstanding and I am sure that a week of fascinating talks, stimulating discussion and generous hospitality awaits us all.

Thanks to you all for your enthusiasm to participate in the programme. I am sure you will leave the meeting feeling inspired, having made new friends and collaborators and with fond memories of NTU and this wonderful part of England.

I look forward to meeting you throughout the week.

Best wishes



Colin Adams
FSBI Honorary President

Nottingham Trent University (NTU)

The institution now known as Nottingham Trent University (NTU) was formed by the amalgamation of several separate education institutions, the earliest of which was Nottingham Government School of Design, which opened in 1843. In 1945, the Nottingham and District Technical College was established; in 1958, Nottingham Regional College of Technology opened and in 1959, the Nottingham College of Education began at what is now the Clifton campus. In 1964, Nottingham Regional College was opened and in 1966, the original Nottingham College of Design was linked with the Regional College. Together, these institutions merged and were upgraded to Polytechnic status in 1970 to become 'Trent Polytechnic', named after the third-longest river in the UK, which bisects the city. In 1975, it amalgamated with Nottingham College of Education, with the official name being changed to Nottingham Polytechnic in 1988.

In 1992 the institution officially became Nottingham Trent University, and continued to expand in order to deliver innovative, high-quality education, and undertake research. The growth of the institution has continued, as Brackenhurst College – Nottinghamshire's land-based agricultural and rural college near the historic market town of Southwell – merged with NTU in 1999, and more recently, in 2015, NTU became the parent company of Confetti Media Group, based in the city of Nottingham. In 2020, NTU began to deliver degree level courses at the new Mansfield campus, approximately 14 miles north of the city.

In recent years, NTU has received many accolades. In 2017, the university received the Times Higher Education 'University of the Year Award' and in 2018, the 'Modern University of the Year Award' from the Sunday Times. In 2019, the Guardian awarded NTU its 'University of the Year' award, and in 2022, the University was named as the best UK university for student life by WhatUni. Now based at six campuses across the county, NTU is now the sixth largest university in the UK by student number, with over 38,000 students, and the largest recruiters of home undergraduates. In the 2021 Research Excellence Framework assessment, NTU made submissions to 14 discipline-based Units of Assessment, showing that 83% of its research activity was classed as either world-leading or internationally excellent.



History of NTU's Brackenhurst Campus

Far from the hustle and bustle of the city, NTU's [Brackenhurst campus](#) is home to ca. 1800 students and over 100 university staff. As a working farm and a wildlife haven, the estate is fully equipped with all the facilities you would expect of a modern University campus specialising in the field of animal, rural and environmental sciences – from our brand-new Lyth building at the heart of campus to our dedicated veterinary nursing centre, animal unit, food laboratory and more. The campus also has a fascinating history.

The area south of the market town of Southwell has been known as Brackenhurst since 1561. ('hurst' = wooded hill, with 'Brack' possibly relating to either bracken or badgers, which remain common in the area). The Reverend Thomas Coats Cane bought a small group of fields (37 acres) in the area in 1827, where he established the Brackenhurst Estate, although there is no evidence of any buildings on this land prior to this date. The country house was built in 1828 but was smaller than it appears today. The two cedar trees were planted in the 1830s, and at that time the farm spanned 36 acres.

Thomas and Mary Coats Cane had a number of children, one of whom, Catherine, gave birth to Edmund Allenby in 1861 in one of the rooms of Brackenhurst. He became Field Marshall Lord Allenby, a famous figure in the Palestine Campaign of the First World War. A Blue Plaque commemorating Allenby can be seen on Main Hall. After Thomas's death in 1887, the house passed to the Hicking family, wealthy merchants from Nottingham, who made a number of significant changes to the house and grounds. William Hicking expanded the estate to farm Dairy Shorthorn cattle (breeding one of the best of the breed, 'Brackenhurst Jean', ever known, apparently) building the farm to 250 acres.

The Hickings enlarged the house considerably, adding a third floor and balustrading and a tower were added to embellish the property. Main rooms were oak-paneled using oak from other houses, and plasterwork added. The gardens were improved in the arts and crafts style, with a willow-pattern style dew pond and boat house, rose garden and a ha-ha (or sunken wall). Brackenhurst was renamed Brackenhurst Hall.

Between 1917 and 1919 William and family moved out of the Hall to allow the house to be used as a hospital for injured soldiers of WW1. A Baronetcy was created for William Hicking in 1917 (superseded by another in 1920 which allowed for this title to be inherited by the sons of his daughters); the title was conferred in gratitude of services rendered. On Sir William's death in 1947, Nottinghamshire County Council bought the property, and it became a Farm Institute, used to train ex-soldiers in the skills of farm work. The estate was owned by NCC until 1992, when it became Brackenhurst College, Nottinghamshire's land-based college.

In 1999 Brackenhurst merged with Nottingham Trent University and has been a thriving campus of the University ever since.



(Julia Davies & Iain Barber)

The Lyth Building

Brackenhurst Campus' Lyth building acts as a welcoming focal point for the campus and provides a central space for students and staff to study, relax, eat, collaborate and meet friends. It provides the focal point for scientific sessions at FSBI 2022.

The Lyth Building complex – named after Philip Lyth, who was Principal of the Nottinghamshire College of Agriculture at Brackenhurst for 25 years and founder and President of the Nottinghamshire Farming and Wildlife Advisory Group – was completed in early 2020, just before the Covid pandemic took hold. After periods serving as a Covid testing centre and Covid vaccination centre for the community, it was fully adopted by the School for teaching and research from 2021. The building houses a 200-seat lecture theatre, a state-of-the-art research laboratory, 60-seat geospatial computer teaching laboratory, two SCALE-UP rooms designed for active collaborative learning, tutorial rooms and staff offices, collaborative breakout spaces and the campus's main refectory. The seating in the lecture theatre is retractable, allowing reconfiguration to a large exhibition space.

The landscaping around the Lyth has been specifically aimed at situating the Lyth building within the existing heritage parkland of the hall, and to provide a relaxing environment for staff and students. The building comes to life in the summer when the café spills out into the landscape, with tables and chairs outside on the paved area around the mirror pool. The garden also preserves the heritage of the site, in particular reinstating the avenue of trees along the main drive from the old gates to the hall.

In May 2022, the Lyth Building, designed by Evans Vettori Architects, was announced as the 2022 Royal Institute of British Architects (RIBA) East Midlands Building of the Year. The Awards jury said: *"The Lyth sits elegantly into its context of listed buildings and designed landscapes, while giving a centre and focus to the burgeoning campus of NTU. It has raised the bar for future development."*



Catering and campus facilities

Breakfasts, lunches and evening meals on Monday and Tuesday will be held in the **Lyth Refectory** (right), in the Lyth Building.

Breakfast serving times:

- 0730 - 0830 Tuesday – Thursday
- 0730 - 0900 Friday

Lunches and dinner times are as advertised in the main Symposium programme.

The NTSU / Costa franchise outlet café – the **Orangery** (right) – will also be open for the sale of hot and cold beverages and snacks during the Symposium.

Orangery opening hours: 0800-1500

The **Brack Bar** will be open on the Tuesday and Wednesday evenings.

The **Barbeque** on Wednesday evening will be held on the lawn, weather depending. In the event of rain, we will adjourn to the refectory.



Toilets are gender-neutral, with sanitary bins and baby-changing facilities, can be found in the Lyth Building.

A **multifaith space** in the Pippin Building (Room PCU5) will be made available for guests for the duration of the Symposium.

Southwell Leisure Centre is located close to the Brackenhurst campus, with a swimming pool, gym facilities and fitness suites. Please see their website for opening times and charges <https://www.active4today.co.uk/ourcentres/southwellleisurecentre/>

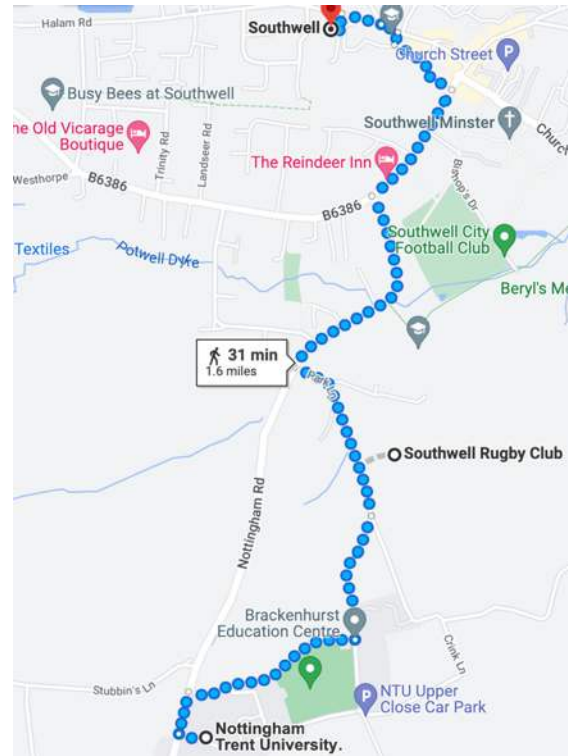
The **Brackenhurst Campus** and surrounding area are fantastic for birdwatching, walking, jogging, and running. We have included a [map](#) with some suggested trails in the welcome pack, but please feel free to explore while you are with us. Please understand, however, that as a working farm and country estate, some routes / areas may be closed for farming or safety reasons, so please ensure that you abide by any signage or instruction. ***Please do not attempt to feed the animals (domestic or wild) on site.***

The **Campus Security** office is located in Pippin Cottage and is manned 24 hours a day. Contact **(+44) (0) 115 848 5262** or **(+44) (0) 7786 112005** if you encounter any problems.

Southwell

Southwell (pronounced either South-well or “Suthall” depending on who you speak to...!) is situated just a mile down the hill from the Brackenhurst campus and is a minster and market town in the district of Newark and Sherwood in Nottinghamshire. It is home to the spectacular grade-I listed [Southwell Minster](#), the cathedral of the Anglican Diocese of Southwell and Nottingham. As well as the Minster – which is definitely worth a visit – Southwell also has the best-preserved example of a [19th century workhouse](#), one of hundreds of workhouses built across the country, which is now owned by the National Trust for England. The town also has a great selection of restaurants, cafés, and pubs.

There are two suggested walking routes into Southwell, each taking approximately 30 minutes, either following the path by the main road (Nottingham Road) or by walking through the back lanes (shown in the map to the right).



Alternatively, buses run every 30 minutes between the campus and Southwell.

More information about the town and its facilities are provided at <https://visitsouthwell.co.uk/>



Nottingham Castle Tour and Banquet in the City

On Thursday 28th July we will depart Brackenhurst campus by coach to visit Nottingham Castle – please see below some information about our planned visit. Following this we will travel to our City Campus for our Banquet and Medal Award Ceremony before returning by coach back to Brackenhurst.

Relive Robin's rebel adventures Experience the fun and folklore of medieval Nottingham and understand how social justice was as important then as it is now. Wander through the Castle Tunnel and head for the Robin Hood Adventures gallery, where you can immerse yourself in the legend with our digital "in the round" storytelling screens.

Test out your skills in our interactive gaming spaces and fire digital longbows as you outwit the tyrannical Sheriff in a Golden Arrow archery competition. Or wield a quarterstaff to spar with Little John in the depths of Sherwood Forest.

Plus, see what life was like in medieval times on our innovative interactive gaming tables and discover whether you can survive the dangers of 14th century Nottingham.

Castle Caves Underground Tour Descend into the remarkable caves that snake through Castle Rock on a 25-minute tour exploring the foundations of the medieval Castle. Hear tales of Nottingham and its historic Castle in the atmospheric underground caves where the stories actually took place.



Find out more about what you might discover on your tour [here](#).

Internet access on campus

Wi-Fi at NTU

There will be two different networks to connect to depending on your location during the Conference:

Location

NTU Campus Buildings
Brackenhurst Halls of Residence (accommodation)

Wi-Fi Service to connect to:

ntu-guest
ntu-halls-guest

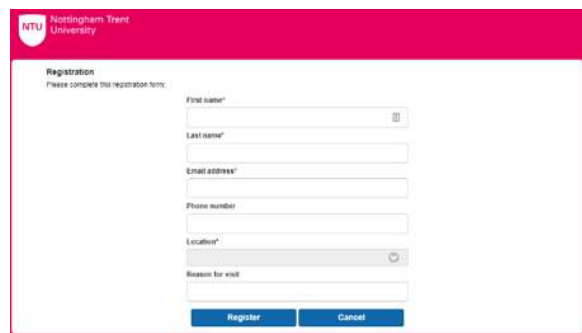
To connect to ntu-guest

Please connect to **ntu-guest**

If this is the first time you wish to connect you will not have a username and password so you will need to self-register using the link **“Click here to register for guest access”**. You will then see the screen to the right:

The screenshot shows the 'Sign On NTU Quest Access' page. It has a header with the NTU logo and 'Nottingham Trent University'. Below the header, it says 'Sign On NTU Quest Access'. There is a text box that says 'Sign in or register below for access (NTU students and staff use the ntu-wifi network)'. Below this are two input fields: 'Username:' with the placeholder 'com@openntu' and 'Password:'. There is a 'Sign On' button at the bottom right. A link at the bottom says 'Click here to register for guest access'.

You will need to fill in the registration screen, with the mandatory fields being first name, last name and email address. The email address will be used to email you the login details. Once filled in you click **Register**. You will then see the next screen.

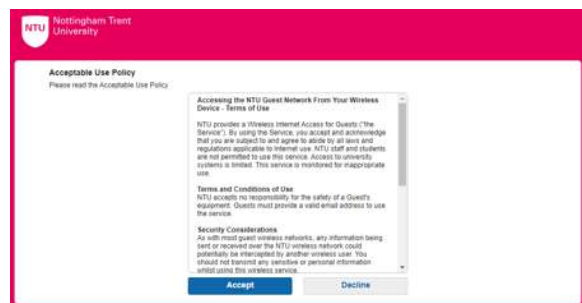
The screenshot shows the 'Registration' page. It has a header with the NTU logo and 'Nottingham Trent University'. Below the header, it says 'Registration'. There is a text box that says 'Please complete this registration form:'. Below this are five input fields: 'First name*', 'Last name*', 'Email address*', 'Phone number', and 'Location*'. There is a 'Register' button at the bottom right and a 'Cancel' button at the bottom left.

At the same time your username and password details will be sent to the email address you entered on the registration form.

The screenshot shows the 'Account Created' page. It has a header with the NTU logo and 'Nottingham Trent University'. Below the header, it says 'Account Created'. There is a text box that says 'Your network access details have also been sent to you by email. Please use these details to sign on the next time you are prompted:'. Below this are two text boxes: 'Username:' and 'Password:'. There is a 'Sign On' button at the bottom right.

From here you can “sign on” and use the internet.

The Acceptable Use Policy will be displayed the first time you sign on, and again every 24hr period you connect.

The screenshot shows the 'Acceptable Use Policy' page. It has a header with the NTU logo and 'Nottingham Trent University'. Below the header, it says 'Acceptable Use Policy'. There is a text box that says 'Please read the Acceptable Use Policy'. Below this is a scrollable area containing the policy text. At the bottom are two buttons: 'Accept' and 'Decline'.

Once accepted you will get the Success page and the top right-hand corner should change to **Done**. Clicking on this will then get you access to the internet.



To connect to ntu-halls-guest

Guests connect to **ntu-halls-guest** – open SSID

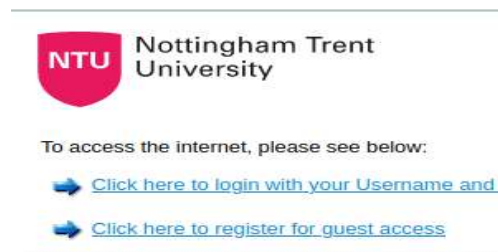
When using a mobile device such as a smartphone, laptop, or iPad you will be prompted as below:

After connecting to **ntu-halls-guest** you will be re-directed to the screen shown to the right:

If you do not receive the above screen, proceed to open a web browser and then browse to <http://www.ntu.ac.uk> - which will then direct you to the page above.

If this is your first time connecting, you will not have a username and password and so will need to self-register using the link “**Click here to register for guest access**”. You will then see the screen below:

You will need to fill in the registration screen, with the mandatory fields being Your Name and Email Address. The email address will be used to email you the login details. Accept the terms and conditions. Once filled in please click **Register**. You will then see the next screen.



Nottingham Trent University

Please complete the form below to gain access to the network.

* Your Name:	
* Email Address:	
* Password:	
* Confirm:	

☐ I accept the [terms of use](#)

* required field

From here you can click the “Log in” button and use the internet.

At the same time your username and password details will be emailed to the email address you entered on the registration form.

Sample of email that will be sent to user:

The terms and conditions will have to be accepted the first time you sign on and again every 24hr period you connect.

Once accepted you will get the following page. Clicking on this will allow you to access the internet

NB Some devices may not connect automatically; in this case then go directly to the authentication page. In such cases, once connected to ntu-halls-guest you will need to go to a browser and browse to <http://www.ntu.ac.uk> . This will then trigger the web re-direction to the registration/login pages.

Linux users will need to open the Firefox web browser and once connected to ntu-halls-guest, click on the banner.

Nottingham Trent University

You are being emailed a confirmation email that you must validate to gain 5 d

Guest's Name:	nigel lynch
Account Username:	lynchnigel@gmail.com
Guest Password:	556989
Activation Time:	Thursday, 16 June 2022, 2:07 PM
Expiration Time:	Thursday, 16 June 2022, 2:17 PM

Nottingham Trent University

Travelling to the Brackenhurst Campus

How to get here

By car

Brackenhurst can be reached from the M1 by leaving at any of the Nottingham exits (Junctions 24, 25 or 26), travelling through Nottingham city centre, then following the A612 towards Southwell.

From the A1, exit at Newark and follow signs to Southwell. Brackenhurst is on the A612 about one mile beyond Southwell.

By bus

Brackenhurst is served by the Nottingham City Transport (NCT)'s Pathfinder 26 bus service, which links Nottingham city centre to Southwell. Catch the service on King Street in Nottingham or Norwood Gardens in Southwell.

Tel: +44 (0)115 950 60 70 (NCT)
www.nctx.co.uk

By rail

Use Nottingham station and catch the NCT Pathfinder 26 bus service from King Street (about 10 minutes' walk).

Tel: +44 (0)3457 484950
(National Rail Enquiries)
www.nationalrail.co.uk



Map of the Brackenhurst Campus



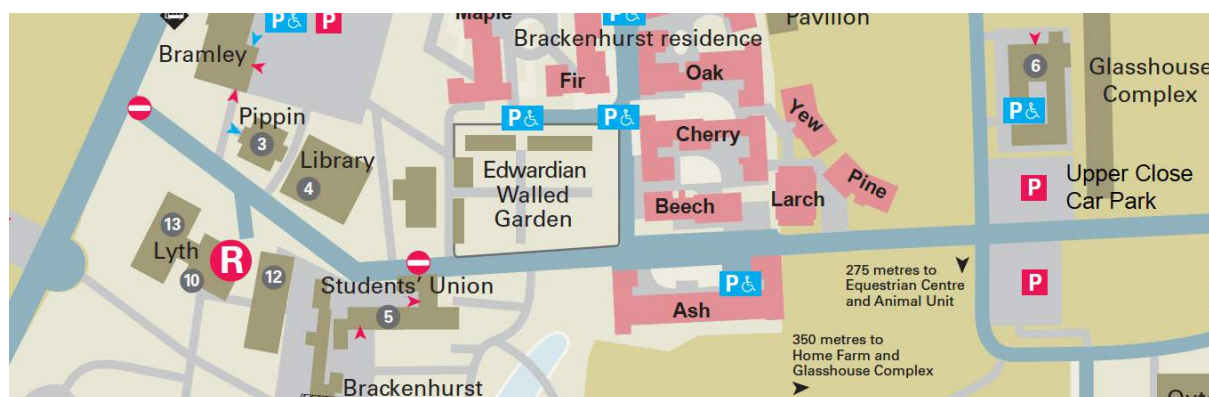
Animal Unit and Veterinary Nursing Centre...	1
Brackenhurst Farm House.....	9
Brackenhurst Schools Unit.....	6
Bramley	2
Employability Centre.....	2
Equine Office and Classroom	7
Library	4
Lyth and Main Reception	13
Lyth - Teaching Block	12
Mary King Indoor Arena.....	8
Orangery Café.....	5
Pippin Cottage.....	3
Poultry Unit	11
Refectory.....	13
Students' Union	5
Student Support enquiries	10
Workshops	6

Security.....	3
Tel: 0115 848 5262	

	Pedestrian walkway		Main reception
	Parking		Student residences
	Entrance		University buildings
	Entrance with wheelchair access		Bus stops
	Accessible parking		No Entry

Delegate Parking

The **Upper Close car park** on the campus is available to delegates and is free of charge. There is a barrier to access the car park; the security code for this is **2351**. The car park is labelled on the [map](#). There will be an opportunity to unload your car close to the halls of residence on arrival; however, once you have done so you will then need to move your vehicle to Upper Close car park for the duration of the Symposium. The car park has CCTV coverage, however, we would recommend that you do not leave valuables in your vehicle, which is left at your own risk.



Accommodation and Campus Life

On-campus accommodation is provided in en-suite single rooms in our Brackenhurst student halls of residence, located just a few minutes' walk from the Lyth Building.

Keys can be collected from Lyth Reception from the conference team.

Check in: Monday 25 July from 3pm*

Check out: Friday 29 July by midday*

* If you have booked any additional overnight accommodation before or after the Symposium, please collect / return your keys from / to Campus Security. **Please note you will be charged for lost keys.**



The **Campus Security** office is located in Pippin Cottage and is manned 24 hours per day. Contact **(+44) (0) 115 848 5262** or **(+44) (0) 7786 112005** if you encounter any problems.

FSBI 2022 Committees and Teams

FSBI 2022 Conveners

Iain Barber (Nottingham Trent University, UK)
Andrew Hirst (Nottingham Trent University, UK)

NTU-FSBI Symposium Liaison Group

Gary Carvalho
Jane Smith
Ilaria Coscia
Tara Marshall
Iain Barber
Andrew Hirst
Liz Appleton

Local Organising Committee

Iain Barber
Andrew Hirst
Abi Middleham
Liz Appleton
Niki Khan
Nicholas Ray
Cat Sanderson
Dawn Scott
Cassie White

JFB Symposium Issue Editorial Team

Carl Smith (Guest Editor)
Chris Harrod (JFB Editorial Team member)

NTU AV, media and virtual conference teams

Andrew Rutkowski (NTU Brackenhurst AV)
Tom Bee (NTU Confetti)
Natalie Palmer (NTU Confetti)
Thomas Glenn (Student media team)
Rory Fraser (Student media team)
Reagan Shing Hei Yip (Student media team)

2022 Medalists

Each year, the FSBI awards medals for life-long individual contributions to fish biology, with a focus on: ground-breaking research; for conservation, training or public understanding of the discipline; and for exceptional advances in early career. This year, the Society has inaugurated a new medal – the Huntingford Medal, in honour of twice past-President Professor Felicity Huntingford – for the best paper accepted for publication in the *Journal of Fish Biology* by an early career researcher.

The Beverton Medal

The Beverton Medal is presented is awarded annually to a distinguished individual scientist for ground-breaking research and a lifelong contribution to fish biology or fisheries science. The name recognises Ray Beverton, arguably the most important fisheries scientist of the 20th century. His work changed the way that we think about quantifying the dynamics of exploited fish populations.

The Fisheries Society of the British Isles is delighted to award the 2022 Beverton Medal to **Professor Catherine (Katie) Peichel** of the University of Bern, Switzerland.

Professor Peichel is an evolutionary geneticist interested in how change in the underlying genetic and genomic architecture of organisms leads to adaptation in nature and the emergence of new species. Her research approach has been to link laboratory based molecular techniques, with ecological studies undertaken in the field, in particular using the stickleback as a model species. Her work is very highly cited over the last two decades and her ground breaking research has had a very significant impact in this field.



The Le Cren Medal

The Le Cren Medal is awarded annually to an individual or team who have made a significant contribution to the study of fish biology or fisheries science, where the focus is on conservation, training or public understanding of the discipline. The medal is named after Dr David Le Cren, an outstanding fish biologist based at the Freshwater Biological Association labs at Windermere and one of five founder members of the FSBI.

The Fisheries Society of the British Isles is delighted to award the 2022 Le Cren Medal to **Dr Steven J. Cooke**, of Carleton University, Ottawa, Canada.

Dr Cooke's research covers a broad field including fish conservation, management, fisheries exploitation and physiological ecology. He is very prolific author of papers in these fields. His published work also shows an enormous breadth of collaborations across a wide range of disciplines but almost always his work provides practical and applied outputs in areas of fish conservation and management. Dr Cooke is a

founder member of the *Canadian Centre for Evidence-Based Conservation* which is committed to synthesising data to ensuring conservation action is based on the best evidence possible. For all of these reasons Dr Cooke is a very deserving recipient of the 2022 FSBI Le Cren Medal.



The FSBI Medal

The FSBI Medal is awarded to an individual early career scientist who has made an exceptional contribution to any aspect of fish biology or fisheries science.

The Fisheries Society of the British Isles is delighted to announce **Dr Amy Deacon**, of the University of the West Indies, as the 2022 recipient of our FSBI Medal.

Dr Deacon has research interests that cover behavioural ecology, biodiversity, conservation and invasive species. She has published important papers on very applied topics such as remote sensing, conservation strategies and invasive species and well as on fundamental questions such as the origins of biodiversity and the drivers of variation in reproductive strategies. In addition, Dr Deacon has a strong commitment to outreach contributing extensively to popular media outlets on topics around fish biology. Dr Deacon is clearly a exceptional early career scientist who has already made exceptional contributions to fish biology and will certainly make more in the future.



The Huntingford Medal (inaugurated 2022)

The Huntingford Medal is a new medal, first awarded by the FSBI in 2022. The medal name recognises an outstanding research scientist field of fish biology, Professor Felicity Huntingford. Professor Huntingford is a previous Beverton Medal winner, who has made considerable contributions to the development of the FSBI but perhaps most importantly, she has over her long career been a lifelong supporter of early career researchers, nurturing many who themselves have gone on to make important contributions to the field. Throughout her outstanding career she has found time to act as a mentor, advisor and an exemplar of what an outstanding scientist should be.

The Huntingford Medal is awarded annually to the best paper accepted for publication in the Society's Journal of Fish Biology by an early career researcher.

In the first year of its issue, the medal is presented to **Dr Martha Patricia Rincón-Díaz**, of Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Argentina. for her exceptional paper **"Fish functional diversity as an indicator of resilience to industrial fishing in Patagonia Argentina"**

This paper was published in 2021 in the November issue of the 99th volume of the *Journal of Fish Biology*. Her paper beat off competition from 29 other papers from Early Career Researchers. The paper presents a very thorough analysis of the vulnerability of different species to by-catch by the Patagonian fishery. It identifies population tipping points in some temperate fishes and identifies several important areas for future studies. We will be privileged to hear Dr Rincon-Diaz give a talk on her paper at the FSBI symposium in July.



Rincón-Díaz, M.P., Bovcon, N. D., Cochia, P. D., Góngora, M. E., & Galván, D. E. (2021). Fish functional diversity as an indicator of resilience to industrial fishing in Patagonia Argentina. *Journal of Fish Biology*, **99**(5), 1650 - 1667. <https://doi.org/10.1111/jfb.14873>

2022 Keynote Speakers

The 2022 Jack Jones Lecture

John Pinnegar (Cefas, UK)

John Pinnegar is a Principal Scientist and Lead Advisor on climate change at the UK government's Centre for Environment, Fisheries and Aquaculture Science (Cefas). He is Director of the International Marine Climate Change Centre (iMC³) and also the Collaborative Centre for Sustainable Use of the Seas (CCSUS), a joint initiative between Cefas and the University of East Anglia. He recently acted as Lead Author for the 6th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). John's research interests include long-term changes in marine ecosystems, the impacts of future climate change and ocean acidification on marine animal populations, as well as consequences for commercial fisheries, coastal economies, and marine food-webs.



J. Robert Britton
(Bournemouth University, UK)



Rob Britton is an ecologist who studies the impacts of anthropogenic stressors – including fish species introductions, habitat loss and climate change – on aquatic ecosystems. Rob's research often employs stable isotope analysis and aquatic telemetry to inform risk management schemes and evaluate fish eradication programmes. He works on both natural and controlled experimental systems, where he investigates diverse questions, including how climate change impacts cyprinid growth and distribution, how to use biocontrol to manage invasive fish populations and how invasive fish and parasites affect food webs.

Ulrika Candolin
(Helsinki University, Finland)

Ulrika Candolin is a behavioural ecologist investigating the impact human-induced environmental changes have on the behaviour of animals and thereby on populations, communities, and ecosystems. Aquatic ecosystems are continually disturbed by human activities, and the first response of fishes to these disturbances is often through their behaviour. These behavioural responses in turn influence population dynamics and species interactions, with ramifications for ecological processes. Exploring these complex interactions and their effects on ecosystems form the main focus of Ulrika's research.



Benjamin Geffroy
(Ifremer, France)



Ben Geffroy works on various topics in evolutionary biology and ecology at the French Institute for the Exploitation of the Sea (Ifremer). His research background is characterized by an ongoing interest in studying the physiological mechanisms that allow fish to cope with their environments, with specific interest in the capacity of fish to reproduce in different situations. Ben's three major areas of research activity are involved with understanding: (1) the effect of stress on sex determination in fish, from physiology to ecological consequences; (2) the effect of human presence on fish stress and reproduction; (3) the causes and consequences of variation in animal behaviour.

Christina Hicks
(Lancaster University, UK)

Christina Hicks is an Environmental Social Scientist interested in the relationships between people and nature, and how this shapes social, environmental, and health outcomes. Christina's work is global with fieldwork focused on the East and West coasts of Africa. Christina gained her PhD from James Cook University, then held an Early Career Social Science Fellowship at Stanford University, before moving to Lancaster University in 2015. Christina has been awarded an ERC Starting Grant – FAIRFISH, the Philip Leverhulme Prize for Geography, and The Gill Memorial Award from the Royal Geographical Society (with IBG) for her work.



Tim Lamont
(Lancaster University, UK)



Tim Lamont is an ecologist studying marine soundscapes. Many aquatic animals, including fish, use acoustics to communicate, navigate, and sense their environment - but today's natural soundscapes are being altered by climate change and drowned out by anthropogenic noise. Acoustic ecology can provide valuable techniques to monitor and manage ecosystems, and powerfully emotive communication tools for public engagement. By learning to listen, we can better understand and protect our underwater ecosystems.

Josefin Sundin
(Swedish University of Agricultural Sciences, Sweden)

Josefin Sundin is a researcher whose main interests lie in the field of human-induced environmental change and behavioural ecology, both as separate research fields, and in particular when combined. Currently she is working with fisheries research with a focus on management of the European eel.

Josefin is also interested in research ethics, working towards improving research integrity, transparency and replication.



Full Programme

Monday 25th July

From 12:00	Registration Desk opens – Lyth Building Foyer, Brackenhurst Campus Poster set-up
14:00 – 16:00	Optional Workshop: “How to progress towards creating an inclusive, diverse and transparent community in fish and fisheries” [Lyth 108A & B]
16.30 – 18.30	Optional Workshop “How to get published in the <i>Journal of Fish Biology</i> ” [Lyth 108A & 108B]
18:30 - 20:30	Welcome reception (Lyth Building Foyer) Event kindly sponsored by Wiley

Tuesday 26th July

08:30 - 08:45	Symposium opening Iain Barber & Andrew Hirst
08:45 - 09:00	Welcome to NTU Pro Vice-Chancellor (International) Professor Cillian Ryan
09:00 - 10:00	<i>Jack Jones Lecture</i> <i>Chair: Colin Adams (FSBI Honorary President)</i> John Pinnegar Climate change and the future of fish and fisheries (K1)
10:00 - 10:30	Coffee
Session A:	Adaptation to diverse habitats Session Chairs: J. Rob Britton / Eleanor Greenway
10:30 - 10:45	Melanie Massey Differential reproductive plasticity under thermal variability in a freshwater fish (<i>Danio rerio</i>) (A1)
10:45 - 11:00	Guðbjörg Ólafsdóttir Migratory ecotypes of Atlantic cod as juveniles: implications for conservation (A2)

11:00 - 11:15	Sam Fenton The adaptive diversity of Arctic charr in Scotland (A3)
11:15 - 11:30	Jack Cooper The extinct shark <i>Otodus megalodon</i> was a transoceanic super-predator: inferences on feeding ecology based on 3D modelling (A4)
11:30 - 11:45	Jessica Rodger Complex landscape, instream and anthropogenic environmental features drive genetic and morphological structuring amongst brown trout (<i>Salmo trutta</i>) in a dendritic river system (A5)
11:45 - 12:00	Rui Vieira The importance of cephalopods in the diet of fish on the Northwest European shelf (A6)
12:00 - 12:15	Darryl McLennan Sustained swimming performance is independent of organism-level and mitochondrial-level metabolism in European minnows (A7)
12:15 - 12:30	Josh Hufton Linking gene expression to divergent adaptations in ecologically functional traits in East African cichlid fishes (A8)
12:30 – 13:30	Lunch (Lyth Refectory)
Session B:	Physiological and behavioural responses to a warming world Session Chairs: Filip Volckaert / Sarah Borsetti
13:30 - 14:15	<i>Invited keynote talk</i> Ben Geffroy (Ifremer, France) Environmental change and sex determination in fishes (K2)
14:15 - 14:30	Daniel D'Agostino Growth impacts in a changing ocean: insights from two coral reef fishes in an extreme environment (B1)
14:30 - 14:45	Bethany Smith Performance consequences of thermal adaptation in geothermal sticklebacks (B2)
14:45 - 15:00	Annie Grigg Plastic responses in Zebrafish (<i>Danio rerio</i>) due to thermal variability impact body shape and size (B3)
15:00 - 15:15	Patrick Eskuche-Keith Temperature alters the size selectivity of Southern Ocean fish (B4)

15:15 – 15:45

Coffee

Session Chairs: Chiara Papetti / Michelle Valliant

15:45 - 16:00

Beverton Medal winner talk

Catherine (Katie) Peichel (*virtual*)

Genetics of adaptation to dynamic environments (M1)

16:00 – 16:15

Anne Gro Salvanes

West Norwegian sill fjords as natural infrastructures for investigating consequences of ocean deoxygenation on fish (B5)

16:15 - 16:30

Martine Solås

Vertical distribution of mesopelagic sound scattering layers in Norwegian fjords with different oxygen and light conditions (B6)

16:30 - 16:45

Francesco Saltalamacchia

Life in oxygen-poor environments: growth and life history of the glacier lanternfish (*Benthosema glaciale*) in West Norwegian fjords (B7)

16:45 - 17:00

Barnaby Roberts

Larval whitefish diet, growth and density in Lake Constance (B8)

17:00 - 17:15

Alexia González-Ferreras

Temperature and land-use effects on fish metabolism in two river catchments of Northern Spain (B9)

17:15 - 17:30

Grace Vaughan

Thermal tolerance and acclimatory capacity of fishes living on the world's hottest reefs (B10)

17:30 - 17:45

Emily Saunders

Laying the foundations for an evidence base of healthy landscapes for sustaining life under water (B11)

Speed Talks (Session 1)

17:45 - 17:48

Clement Ng

Contrasting impacts of active and passive fishing techniques on different behavioural and physiological traits (S1)

17:48 - 17:51

Zelin Chen

Examining anthropogenic and environmental impacts on North Sea food webs (S2)

17:51 - 17:54

Faye Moyes

Change in functional rarity in marine fish assemblages is linked to shifts in species abundance distributions (S3)

17:54 - 17:57

João Miguel Moreno (*virtual*)

Thermal tolerance in Iberian freshwater fish in face of climate change (S4)

17:57 - 18:00

Rosslyn Watret

The variability of cortisol within fish tissue (S5)

19:00 - 20:00 **Dinner** (Lyth Refectory)

20.00 onwards **Pub Quiz** (NTSU Brack Bar) and / or time to explore Southwell

Wednesday 27th July

Session C: Behavioural ecology of fish in a dynamic world

Session Chairs: Felicity Huntingford / Molly Clark

08:30 - 09:15 *Invited keynote talk*

Ulrika Candolin

Impacts of environmental change on the behavioural ecology of fish
(K3)

09:15 - 09:30

Hannah MacGregor

Shoaling behaviour in response to turbidity in three-spined sticklebacks
(C1)

09:30 - 09:45

Cait Newport

The impact of increased temperature and turbidity on the feeding and movement behaviour of three-spined sticklebacks (*Gasterosteus aculeatus*) (C2)

09:45 - 10:00

Anna Garcia

How does reduced visibility impact the sensory basis of distance estimation in goldfish? (C3)

10:00 – 10:30

Coffee

Session Chairs: Carl Smith / Spencer Weinstein

10:30 - 10:45

Joris Philip

Among-individual variation in risk-taking behaviour in group and solitary contexts is uncorrelated but independently repeatable in a juvenile Arctic charr (*Salvelinus alpinus*). (C4)

10:45 - 11:00

Jessie Lilly

Investigating the behaviour of Atlantic salmon smolts during the early marine migration. (C5)

11:00 - 11:15

Amy Green

Assessing the impact of river barriers on successful seaward migration of Atlantic salmon, *Salmo salar* along the River Derwent, Cumbria. (C6)

11:15 - 11:30

Hannele Honkanen

Atlantic salmon smolt migration through lakes: combination of stochastic and directed movements. (C7)

11:30 - 11:45

Matthew Newton

Marine migrations of salmon in highly developed seas – potential impact of marine renewable developments. (C8)

11:45 - 12:00	Kristi Källo Do all roads lead to home? Complexity in straying behavior of anadromous brown trout (<i>Salmo trutta</i>) throughout its life. (C9)
12:00 - 13:00	FSBI Annual General Meeting (Lyth Building, Rooms 108A & B)
12:00 - 13:30	Lunch (Lyth Refectory)
Session D:	Impacts of anthropogenic stressors on fish behaviour and ecology Session Chairs: Christos Ioannou / Theresa Henke
13:30 - 14:15	<i>Invited keynote talk</i> Tim Lamont Learning to listen: acoustic ecology in a dynamic world (K4)
14:15 - 14:30	Ben Williams The future of how we monitor fish communities through listening (D1)
14:30 - 14:45	Helen Currie Application of Signal Detection Theory to understand the anti-predator responses of cyprinids to masked acoustic signals in still and flowing water (D2)
14:45 - 15:00	Emma Weschke Night vision cameras reveal impacts of artificial light on nighttime fish communities (D3)
15:00 - 15:15	Michelle Valliant Inter and intra-specific variation in how anthropogenic impact correlates with near-shore fish movement (D4)
15:15 - 15:30	George Balchin Investigating multiscale temporal trends and the effect of diving tourism on shark top predators in the Egyptian Red Sea (D5)
15:30 - 16:00	Coffee Session Chairs: Ana Gro Vea Salvanes / Bethany Smith
16:00 - 16:45	<i>Invited keynote talk</i> Josefin Sundin Fishy business: the importance of research integrity, transparency, and replication (K5)

16:45 - 17:00	<i>FSBI Medal winner talk</i>
	Amy Deacon Bringing the guppy home (M2)
17:00 - 17:15	<i>Huntingford Medal winner talk</i>
	Martha Patricia Rincón Díaz Fish functional diversity as an indicator of resilience to industrial fishing in Patagonia Argentina (M3)
Speed Talks (Session 2)	
17:15 - 17:18	Anthony Snead (virtual) <i>Left behind: habitat suitability shifts of a euryhaline fish (S6)</i>
17:21 - 17:24	Justas Dainys (virtual) <i>Recreational angling and commercial fishing: angling prevents recovery of valuable and predatory species after a commercial fishing ban (S7)</i>
17:24 - 17:27	Clemency White <i>Sensory ecology of sharks in a changing world (S8)</i>
17:27 - 17:30	Chiara Papetti <i>Species delimitation and population genetic differentiation of Antarctic fish in the Weddell Sea and Antarctic Peninsula (S9)</i>
19:00 - 20:30	Barbeque (on the Lawn / Lyth Refectory, weather depending)
Evening	NTSU Brack Bar open / free time to explore Southwell

Thursday 28th July

Session E: Ecology of invasions, parasites and disease

Session Chairs: Ian Winfield / Ben Parker

08:30 - 09:15	<i>Invited keynote talk</i>
	J. Rob Britton Contemporary perspectives on the ecological impacts of invasive freshwater fishes: from individual effects to ecosystem collapse (K6)
09:15 - 09:30	Daniel Gomez-Uchida Genomic signatures of selection support preadaptation of invasive Chinook salmon in multiple continents (E1)
09:30 - 09:45	Theresa Henke The origin of non-indigenous European flounder (<i>Platichthys flesus</i>) in Iceland and its hybridization with European plaice (<i>Pleuronectes platessa</i>) (E2)

- 09:45 - 10:00 **Emily Yeung**
Boldness, activity and exploration tendency in round goby (*Neogobius melanostomus*) in central Ontario. (E3)
- 10:00 - 10:30 **Coffee**
Session Chair: Amy Deacon / Jack Cooper
- 10:30 - 10:45 **Chris Harrod**
Impacts and responses to a massive escape of non-native Atlantic salmon in southern Chile: consumption of native prey countered by biotic resistance from native predators and opportunistic fishing. (E4)
- 10:45 - 11:00 **Karina González**
Spatial and temporal variation in the trophic ecology of the world's highest-altitude (4500 m) self-sustaining population of invasive rainbow trout (Lago Chungará, Chile). (E5)
- 11:00 - 11:15 **Ada Fontrodona Eslava**
Multifaceted temporal biodiversity change in the stability of tropical fish communities (E6)
- 11:15 - 11:30 **Vitalja Bartuseviciute**
How does fishing affect resistance? Empirical insights from a guppy-*Gyrodactylus* model system (E7)
- 11:30 - 11:45 **Ben Parker**
Freshwater fish, parasites and microplastics (E8)

Speed Talks (Session 3)

- 11:45 - 11:48 **Helen Currie**
*A novel mechanical approach to understanding the impact of the invasive nematode *Anguillicoloides crassus* on the European eel (*Anguilla anguilla* L.) swimbladder* (S11)
- 11:48 - 11:51 **Amy Shurety**
Environmental impacts on northern marine food webs across spatiotemporal scales (S10)
- 11:51 - 11:54 **Sophia Webb**
*Population structure and introgression in wild populations of European seabass (*Dicentrarchus labrax*)* (S11)
- 11:54 - 11:57 **Régis Santos (virtual)**
Trends in abundance indices derived from commercial fishery for priority marine stocks in the Azores (S12)
- 12:57 - 12:00 **Michael Curtis (virtual)**
*Assessing metapopulation dynamics of two endangered cyprinids (*Notropis oxyrhynchus* and *Notropis buccula*) in a drought-prone river system* (S13)

12:05 - 12:20 *Le Cren Medal winner talk*

Steven J. Cooke (virtual)

Dynamic fisheries management for a dynamic world (M4)

12:30 - 13:30 **Lunch** (Lyth Refectory)

Session F: Populations and communities in a dynamic world

Session Chairs: Anne Magurran / Emma Weschke

13:30 - 14:15 *Invited keynote talk*

Christina Hicks

Fisheries and nutrition (K7)

14:15 - 14:30

Adam Andrews

Historical perspectives on population dynamics: Investigating responses of Atlantic bluefin tuna to climate and exploitation throughout two millennia with bioarcheology (F1)

14:30 - 14:45

Mar Pineda

Investigating the mechanism underlying fishing-associated selection in the ornamental fishing industry (F2)

14:45 - 15:00

Eleanor Greenway

Population dynamics of elasmobranchs in the North Sea (F3)

15:00 - 15:15

Sarah Borsetti (American Fisheries Society Travelling Fellow talk)

Interactive effects of wind farms and future ocean conditions on the U.S. surfclam fishery (F4)

15:30

Depart on buses for Nottingham (Nottingham Castle tour and symposium banquet and medal awarding ceremony)

Buses leave Nottingham for the return journey to Brackenhurst at 23:00

Friday 29th July

Session G: Tools and methods for the analysis of fish and fisheries in a dynamic world

Session Chair: Iain Barber / [TBC]

09:00 - 09:15

Spencer Weinstein (American Fisheries Society Travelling Fellow talk)

A mixed methods approach to characterizing the diversity of chars (*Salvelinus* spp.) in the central Canadian Arctic (G1)

:15 - 09:30

Chris Brodie

Can eDNA be used to monitor and predict fluctuations of Atlantic bluefin tuna in British waters? (G2)

09:30 - 09:45 **Iestyn Penry-Williams**
Environmental DNA-derived predator diversity as a predictor of anti-predator behavioural divergence between prey populations (G3)

09:45 - 10:00 **Molly Clark**
A novel method for studying fish groups and populations in the field (G4)

Speed Talks (Session 4)

10:00 - 10:03 **Re'em Neri (virtual)**
Social media monitoring reveals wide-spread Elasmobranch fishery in the Gaza strip (S14)

10:03 - 10:06 **Tasaduq Shah (virtual)**
Effects of formalin and alcohol on length, weight and condition factor of snow trout Schizopyge niger (Cyprinidae) (S15)

10:06 - 10:09 **Régis Santos (virtual)**
Length-based estimates of growth and mortality of seven data-limited fishes in the Azores (S16)

10:09 - 10:12 **Denise Crampton (virtual)**
Taxonomic revision of the Astatotilapia (Teleostei: Cichlidae: Haplochromini) inhabiting the East flowing rivers of Tanzania, with the description of four new species from the Rufiji river catchment (S17)

10:12 - 10:15 **Sathyaruban Sutharshiny (virtual)**
Goldfish accepted the formulated dry pellets incorporated with palmyrah fruit pulp? (S18)

10:15 - 10:45 **Coffee**

Session Chair: Andrew Hirst / [TBC]

10:45 – 11:00 **Kitty Pillay**
Using metabarcoding and stable isotope analysis to investigate the feeding paradigm of mangrove fishes (G5)

11:00 - 11:15 **Nildeniz Top-Karakuş**
DNA barcoding reveals absence of genetic diversity and synonymy of three freshwater Aegean *Luciobarbus* species (G6)

11:15 - 11:30 **Daria Zelenina**
The major histocompatibility complex in Pacific salmon: balancing versus directional selection (G7)

11:30 - 11:45 **Paul Bangura**
Linking Vgll3 genotype and aggressive behaviour in juvenile Atlantic salmon (*Salmo salar*) (G8)

11:45 - 12:15 Closing address and student prizes (sponsored by Wiley)

12:15 - 14:00 Farewell lunch and departure

Posters

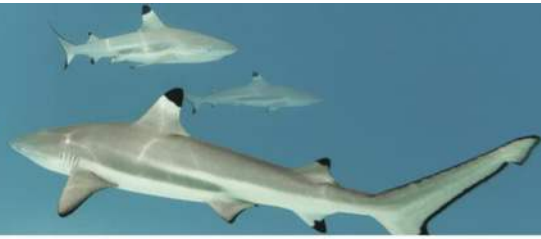
In-person, physical posters (*with speed talk)

Ella Ackroyd	Dynamic colour change in zebrafish (<i>Danio rerio</i>) (P1)
Zelin Chen	Examining anthropogenic and environmental impacts on North Sea food webs* (P2)
Helen Currie	A novel mechanical approach to understanding the impact of the invasive nematode <i>Anguillicoloides crassus</i> on the European eel (<i>Anguilla anguilla</i> L.) swimbladder* (P3)
Jack Cooper	Are shark teeth proxies for functional traits? (P4)
Justas Dainys	Recreational angling and commercial fishing: angling prevents recovery of valuable and predatory species after a commercial fishing ban* (P5)
Mark Keating	3D hydraulic modelling for fish passages (P6)
Francesca Mason	Parasite toxicity in the small-spotted catshark <i>Scyliorhinus canicula</i> (P7)
Matthew Newton	Can freshwater migration patterns of Atlantic salmon be predicted by random models? (P8)
Clement Ng	Contrasting impacts of active and passive fishing techniques on different behavioural and physiological traits* (P9)
Chiara Papetti	Species delimitation and population genetic differentiation of Antarctic fish in the Weddell Sea and Antarctic Peninsula* (P10)
Amy Shurety	Environmental impacts on northern marine food webs across spatiotemporal scales* (P11)
Roslyn Watret	The variability of cortisol within fish tissue* (P12)
Sophia Webb	Population structure and introgression in wild populations of European seabass (<i>Dicentrarchus labrax</i>) * (P13)
Clemency White	Sensory ecology of sharks in a changing world* (P14)

Virtual, electronic posters (*with virtual speed talk)

Denise Crampton	Taxonomic revision of the <i>Astatotilapia</i> (Teleostei: Cichlidae: Haplochromini) inhabiting the East flowing rivers of Tanzania, with the description of four new species from the Rufiji river catchment*
Michael Curtis	Assessing metapopulation dynamics of two endangered cyprinids (<i>Notropis oxyrhynchus</i> and <i>Notropis buccula</i>) in a drought-prone river system*
João Miguel Moreno	Thermal tolerance in Iberian freshwater fish in face of climate change*
Faye Moyes	Change in functional rarity in marine fish assemblages is linked to shifts in species abundance distributions*
Re'em Neri	Social media monitoring reveals wide-spread Elasmobranch fishery in the Gaza strip*
Régis Santos	Length-based estimates of growth and mortality of seven data-limited fishes in the Azores*
Régis Santos	Trends in abundance indices derived from commercial fishery for priority marine stocks in the Azores*
Tasaduq Shah	Effects of formalin and alcohol on length, weight and condition factor of snow trout <i>Schizopyge niger</i> (Cyprinidae)*
Anthony Snead	Left behind: habitat suitability shifts of a euryhaline fish*
Sathyaruban Sutharshiny	Goldfish accepted the formulated dry pellets incorporated with palmyrah fruit pulp?

JOURNAL OF FISH BIOLOGY



Publish with *Journal of Fish Biology* and enjoy these benefits:

1. Easy and efficient publishing with **NEW flexible** submission process and free colour for images in print and online.
2. Increasing Impact Factor of **2.038**
3. Rapid publication, with articles published online within days after acceptance.
4. Journal content is regularly featured on Wiley's **@wileyecology** Twitter account, delivering research to over **43,000 followers**.
5. International reach for your research with over **275,500 article** downloads in 2018 and worldwide circulation to **14,500 institutes**.
6. The official journal of the Fisheries Society of the British Isles, which celebrated its **50th Anniversary** in 2017.

19-RM00560/MTM50385



Read *Journal of Fish Biology* online: bil.ly/Read_JFB

WILEY

FLOW-3D®

Solving the World's Toughest CFD Problems

+44 7751768633

info@flow3d.co.uk

United Kingdom

INDUSTRIES

PRODUCTS

EVENTS

RESOURCES

ACADEMICS

CONTACT



INDUSTRIES



Additive Manufacturing

A cutting-edge research tool, **FLOW-3D AM** simulates and analyzes additive manufacturing processes such as laser powder bed fusion, binder jetting, and directed energy deposition.



Coating

FLOW-3D provides high-fidelity modeling for understanding the effects of surface tension, wet adhesion, solvent transport, density-driven flows, and phase change.



Maritime

Free surface hydrodynamics, wave generation, flooding events, mooring lines and mooring processes make **FLOW-3D** an extremely well-suited tool to model CFD processes relevant to the maritime industry.



Aerospace

FLOW-3D provides aerospace engineers valuable insight into fuel stability/oscillations, cryogenic, temperature regulation, PFDs, cavitation, and electric charge distribution.



Consumer Products

From toilet flushing to bottle filling to food processing, **FLOW-3D** is the optimal CFD software for the researching and designing of consumer products for home and office environments.



Metal Casting

With 3D process visualization, powerful post-processing, planning capabilities in filling and solidification and defect analysis, **FLOW-3D/CST** is the optimal metal casting solution.



Automotive

FLOW-3D offers solutions to automotive engineers for fuel tank modeling, underhood thermal management and gaseous control, battery fuel shut-off during fire, brake failure, fluid resistance of powertrain components, and cooling of automotive parts.



Energy

Use **FLOW-3D** to maximize the safety and efficiency of fuel extraction, storage and transport techniques, and nuclear energy infrastructure, and develop alternative energy projects such as offshore wind and wave energy.



Micro/Nano/Bio Fluidics

Flow, size and force/fluidics can be easily and accurately simulated in a virtual laboratory employing **FLOW-3D**'s free surface and multi-fluid modeling capabilities.



Biotech

FLOW-3D is a robust simulation tool for biotech research, with an extensive range of capabilities including free surface/confined flows, variable density, phase change, moving objects, and mechanical and thermal stress analysis.



Laser Welding

FLOW-3D/WELD implements relevant physics such as laser heat sources, laser-material interaction, fluid flow, heat transfer, surface tension, solidification, multiple laser reflections and phase change, allowing researchers to achieve better welding process control.



Civil & Environmental

FLOW-3D is used to address a wide range of issues facing the civil & environmental industry, from large hydroelectric power projects, low-head dams, municipal wastewater and stormwater infrastructure, and moving settings design.



Coastal/Offshore

FLOW-3D accurately predicts the detail of wave storms and transient wave loading on coastal structures and is used for both fixed and off-shore structures, float and mooring analysis.



Nottingham Trent
University



TEMPORARY VISITOR PARKING PERMIT

VISITOR NAME:	
VEHICLE REG:	
REASON FOR VISIT: FSBI2022 Symposium Delegate	
PERIOD VALID:	Sunday 24th July – Friday 29th July 2022
CONTACT:	Prof Iain Barber (Symposium Convener)

