

Eyeless fishes from lightless habitats. There are more than you might imagine and they are not all “cave fishes”



Eidinemacheilus proudlovei (Nemacheilidae) from a cave in Iraq. Jorg Freyhof

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Introduction

The principle aim of this article is to make FSBI members aware of a web site devoted to fishes from lightless environments (Proudlove 2021, cavefishes.org.uk). A further reading list is appended, but to save space only authors and date are provided. You can get the rest of the citation by searching the bibliography on the web site.

Everyone knows about “*blind, white cavefishes*” (even though they are most often a lovely pink colour because the blood shows though the melanin-depigmented skin). Blindness

plus depigmentation is technically termed *trogomorphy*. The reason for the blindness and depigmentation is that cave fishes live in lightless environments for the whole of their lives. But there are also a number of other habitats that are substantially or entirely lightless and the fishes living in these are much less well known.

There are currently six broad habitat types where light lessness is a major selection pressure on fishes. The following is a brief survey of these, with examples. Some superb photographs of these fascinating animals are in Fenolio (2016) – highly recommended.

1. Caves and other subterranean habitats (280 species)

Caves come in all shapes and sizes and are found planet-wide. The

first described subterranean fish was collected in 1840 in Kentucky, USA. Since then 279 more have been found, with the greatest numbers in China (86, 31%), Brazil (36, 13%), USA (21, 7.5%) (=51%).

By far the best known subterranean fish is *Astyanax mexicanus* (Characidae) which accounts for 20% of all records in the bibliography. It is easy to keep and breed in captivity and very amenable to research studies. Its main point of interest is that it is still interfertile with a surface, non-trogomorphic form. The *Astyanax* research community refer to both forms as *A. mexicanus* but an argument can be made that they are two sister species: *A. mexicanus* (surface) and *A. jordani* (cave). The genus with most subterranean species

is the Chinese *Sinocyclocheilus* (Cyprinidae) with at least 37 obligate subterranean species, and a further 34 which are often found in caves but are not troglomorphic. Most subterranean fishes are relatively small (mean around 80mm SL) but the world's largest is 420mm SL, an undescribed species from India (Cyprinidae).

2. Freshwater and marine interstitial habitats (52 species)

Interstitial habitats are where animals live within sandy or

pebbly deposits (also known as psammophily and the fossorial habitat). It is usually thought that only sub-mm scale creatures can manage this and they are called meiofauna. However there are at least 52 species of fishes which are obligate dwellers in sand (31 freshwater, 21 marine). Twenty-one species of Trichomycteridae are interstitial in South America and show many morphological approaches to troglomorphy. *Gouania* (5 species, Gobiidae) is endemic to pebble beaches in the Mediterranean and Adriatic and has a wormlike body and

small eyes, *Luciogobius* (14 species, Gobiidae) is endemic to pebbles in Japan and has body elongation and excessive vertebral segmentation. A blind Sole, *Typhlachirus caecus* (Soleidae), lives in sediments in Borneo marine waters.

3. Deep-sea fishes (50+ Species)

The abyssal depths of the oceans are lightless and there are certainly a number of species of eyeless fishes, though not as many as might be expected. Of course there is the major difficulty of obtaining specimens from this environment and the number of species we know about many be simply because no more have been collected. One reason there are so relatively few eyeless deep-sea fishes is that bioluminescence is common and eyes required to interact in this way.

4. Deep and dark areas in freshwater habitats (49 species)

Both the Congo and the Amazon have troglomorphic fishes, the former with representatives of Cichlidae (*Lamprologus lethops*), Mastacembelidae, Claroteidae, Clariidae, Mormyridae and Mochokidae (12 species). The latter has representative of Aspredinidae (*Xylophious sofiae*), Apterontidae, Loricariidae, Trichomycteridae and Cetopsidae (12 species). The Congo *Lamprologus lethops* (Cichlidae) is one of only a very few non-subterranean species to be relatively well studied. In both rivers sediments and dissolved substances render the water lightless below about 5-10m and both rivers are much deeper than this, the Congo is up to 220m deep!

5. In the burrows of other animals (1? species)

Typhlogobius californiensis (Gobiidae) lives obligately in the burrows of a crustacean *Neotrypaea biffari*



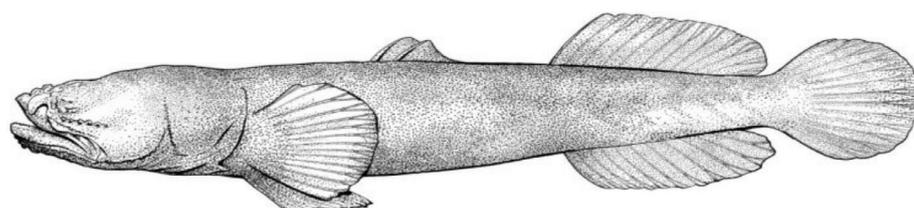
Typhlachirus lipophthalmus (Soleidae) from marine sediments, left=bottom view. H.H. Tan



Lamprologus lethops (Cichlidae) from the deep, dark and turbulent Congo River. Melanie Stiassny



Xylophious sofiae (Aspredinidae) from the deep dark Amazon River. Mark Sabaj



Typhlogobius californiensis (Gobiidae) from Crustacea burrows in California, USA. Leonardo Alanni.

(Callianassidae). It has evolved in this habitat for long enough to show distinct troglomorphisms. Although a very interesting species, and easy to sample, it has not been studied since 1939!

6. Antarctic Lake Vostok (1? species)

Lake Vostok is a large, deep and ancient subglacial lake in Antarctica and it would be reasonable to assume that it is devoid of life, and if it contains any at all it would be limited to prokaryotes. However, DNA sequences of very many organisms have been obtained from ice core samples. The following is from a recent paper:

“3.6. Eastern Section of Embayment (3,585 m accretion Ice). As with the adjacent sample, molecular signals of the possibility of fish were found in this sample, including a sequence closest to *Notothenia coriiceps* Richardson 1844 (black rockcod), a ray-finned fish common in the Southern Ocean near the shores of Antarctica, that has antifreeze proteins and lives at water temperatures between -1° and 4°C.” (Gura and Rogers 2020).

There will come a time when physical samples are taken and only then will we know for sure if there are fishes present. It is easy to predict that any found will be highly troglomorphic given the

great length of time in isolation and the low-level of food supply. If this is so then Lake Vostok will have to count as the most extreme lightless environment known, but this is currently very speculative.

The web site bibliography

Built over a 40 year period the bibliography now has 4984 entries from 1436 onwards.

In addition to accounts for species in the habitats mentioned there are also sections covering:

Species which co-exist (are sympatric) within a cave.

Fishes which are known from caves but which are not cave-adapted (there are a lot).

A very comprehensive history of work on all fishes from lightless habitats.

Further reading

With the exception of Macginitie (1939), which is still the only real source for *Typhlogobius*, all are modern treatments which will allow you to get up to speed on the biology of these animals.

Aardema, M.L., Stiasny, M.L.J. and Alter, S.E. 2020. Deep freshwater

Elliott, W.R. 2018. Subterranean

Fenolio, D. 2016. All habitats

Gore, A., Jeffery, W., Retaux, S. and Rohner, N. 2018. Whole volume. Subterranean

Gura and Rogers 2020. Lake Vostok

Keene, A.C., Yoshizawa, M. and McGaugh, S.E. 2016. Subterranean

Kondo, K. and Kato, M. 2019. Interstitial

Kowalko, J.E., Franz-Odenaal, T.A. and Rohner, N. 2020. Whole volume. Subterranean

Macginitie, G.E. 1939. Crustacean burrows

Priede, I.G. 2017. Deep sea fishes Proudlove, G.S. 2021. All habitats except the abyssal

Schobert, C.S., Stiasny, M.L.J., Schwab, I.R., Zeiss, C. and Dubielzig, R.R. 2013. Deep freshwater

Stiasny, M.L. and Alter, S.E. 2021. Deep freshwater

Thines, G. 1969. All lightless habitats

Trajano, E., Bichuette, M.E. and Kapoor, B.G. 2010. Subterranean Wilkens, H. and Strecker, U. 2017. Subterranean

Wagner, M., Bračun, S., Skofitsch, G., Kovačić, M., Zogaris, S., Iglésias, S.P., Sefc, K.M. and Koblmüller, S. 2019. Interstitial

Yamada, T., Sugiyama, K, Tamaki, K, Kawakita, A. and Kato, M. 2009. Interstitial

Zhao, Y., Zhang, C. and Proudlove, G.S. 2021. Subterranean



Gouania pigra (Gobiesocidae) from gravel beaches in the Adriatic Sea. Maximilian Wagner

Editorial

Whilst this newsletter was being prepared, COP26 was underway in Glasgow. In this issue you will find three videos made by FSBI members that give their perspective on diverse effects on fish of climate change. These cover three different topics and in the first Dr Daphne Cortese of Glasgow University describes an analysis of the effects of coral reef bleaching on the physiology and behaviour of anemone fish. These live in association with anemones which can also undergo bleaching as temperatures increase. The second video has Daniel Ripley outlining how increasing ocean temperatures affect the physiology and life histories of sharks. Being ectothermic, as the ocean warms, the physiology of sharks increases and this can lead to a number of harmful outcomes. Finally, Dr John Pinnegar describes his work on how climate change is influencing commercial fish distributions and the behaviour of the fishing fleets exploiting the fish.

Each of these studies is part of the ongoing research activity taking place all over the world in an attempt to understand better the ways in which climate change is affecting the marine and freshwater environments. At the Glasgow meeting, countries are working towards an agreement which will encourage countries to limit activities that will bring about a slowing of the warming of the world. The big problem with this top-down approach is that to achieve many of the targets, individuals will have to change their behaviour in a very significant way.

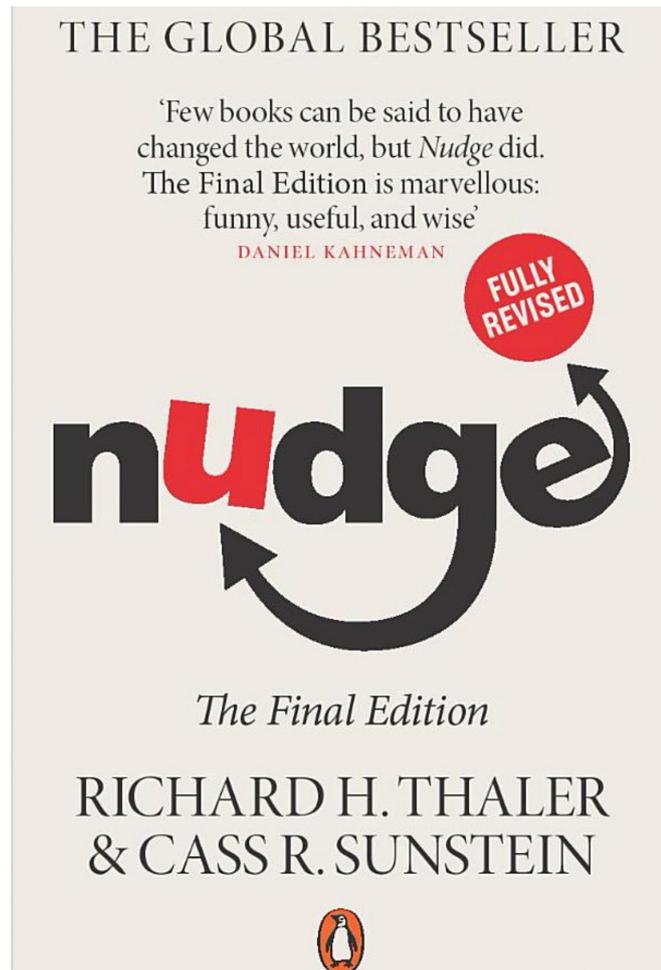
We already have a good idea of the general climate changes that are occurring and there is some agreement on what we need to do to limit the changes. People are urged to eat less meat, to focus mainly on plants

as food, to insulate our homes in cool climates and to convert to electric cars. There are many other measures that are accepted as being necessary. What is needed is much more thinking about how people can be persuaded to change their habits. A guide to this has recently been published by Richard Thaler and Cass Sunstein called *Nudge*. This is a revision and updating of the book with the same title published in 2008. The two authors describe methods which they label as libertarian paternalism, meaning that the measures they propose to persuade people to behave in certain ways are intended to leave the agent to choose freely but to set up the so called choice architecture so that an outcome beneficial to society at large is more likely. Supermarkets have been employing this approach for years by placing own label

products at eye height on the shelves and other brands on the bottom shelves. There are numerous other tricks that are employed to bring about a desired outcome.

For me, it seems essential that alongside the research on the effects of climate change on the state of ecosystems we also need a parallel programme developing measures that will use the nudge approach, which is derived from the discipline of behavioural economics, to design measures that will encourage people to make the choices that will bring about the changes in our ways of life that are so essential.

Paul J B Hart
Leicester, November 2021
Next deadline: 1st February 2022



Letter from the *Journal of Fish Biology* Editor Michel Kaiser



The last several months have been positive for the *Journal of Fish Biology*. We have seen our Impact Factor increase which is hugely encouraging. As the Editor of the Journal I am well aware that the quality of the content that we are publishing is increasing. Inevitably this means that some authors are disappointed because their papers are declined. However, Wiley has implemented a new on-line Journal that provides a forum for ‘worthy’ studies without the need for them to be novel or ground-breaking. This is very welcome as it enables the editorial board to recommend a ‘home’ for these papers. When I look back at some of my own early papers I doubt they would have been published in the current *Journal of Fish Biology*. I was ‘lucky’. This issue weighs heavily on me as the Editor of the journal and I know that many of my editorial colleagues feel similarly about this issue.

I was particularly ‘energised’ by a recent presentation given by Professor Sir Ian Boyd (University of St Andrews and former Chief Scientific advisory to the Department of Environment, Food and Rural Affairs of the UK) when he received an honorary degree at my own institution. In his speech

he indicated that his main focus moving forward was going to be on the issue of Science Integrity. This is an issue about which I feel very passionate. As scientists we need to report facts and also be honest about the limitations of the science that we do. The prognostications that we make could affect people’s lives, so it matters (for some of us). As a result, as Editor of the *Journal of Fish Biology*, I occasionally have

to make some difficult decisions on whether paper are accepted or not. Equally, I am a human like the rest of us, and however ‘objective’ I may consider myself to be, I will have innate prejudices and biases. For that reason, the FSBI Publications Committee has taken upon itself a role as independent ‘judicator’ when there is a conflict between the Editor/Editorial Board and an author. I whole-heartedly welcome this intervention by the FSBI because it provides a platform for authors to ‘air’ their grievances but also provides a process whereby there is a satisfactory resolution for both parties.



Jack Cooper is a 2nd year FSBI funded PhD student working on a thesis entitled *Functional Diversity Through Time: Past, Present and Future*. He is supervised by Dr Catalina Pimiento at Swansea University



Modern sharks are iconic predators in today's oceans and have been so for over 250 million years. This exceptionally long evolutionary history has allowed sharks to occupy almost every marine habitat, feed on a multitude of diets, evolve multiple reproductive strategies and acquire an enormous range in length, from the tiny 20 cm Dwarf Lanternshark (*Etmopterus perryi*) to the enormous 20 m megalodon (*Otodus megalodon*). This huge diversity reflects that sharks play multiple different ecological roles and have likely maintained those roles through deep time. Such roles significantly include exerting top-down trophic control as apex predators. Moreover, their long evolutionary history showcases

their survival of many past extinction events. However, sharks are the most threatened marine vertebrates today, meaning that understanding how they survived past extinction events will provide insights into how they might be affected by today's ecological crisis.

To understand the ecological roles sharks played millions of years ago, and by extension their survival of past extinction events, we need to study their fossil record. Unfortunately, extinct sharks have notoriously bad preservation and often only leave teeth behind. My research is therefore to understand how shark teeth can be used as proxies for their functional traits – measurable intrinsic characteristics that influence a species' ecological role. Such traits include body size and diet, both of which are pivotal for ecology in sharks. Thankfully, shark teeth are hard and easily preserve, and are constantly shed throughout the shark's lifetime. This results in shark teeth being some of the most common fossils available to us. Therefore, being able to link measurements and discrete characters of teeth – also called dental characters – to functional traits in living sharks can serve as an appropriate

template to extinct sharks from the last 66 million years, as these sharks have very similar to dentitions to today's sharks and often occupy the same genera.

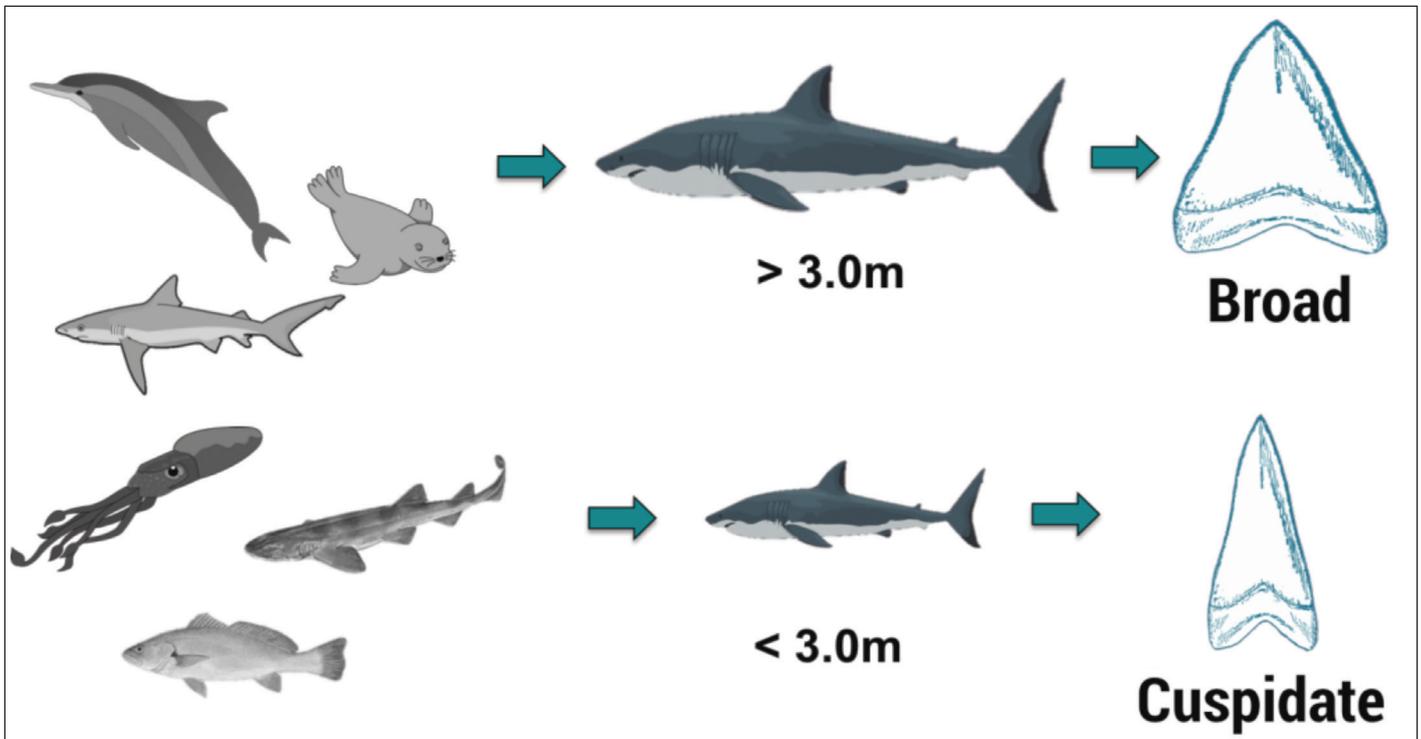


Dr Catalina Pimiento

To find these links, I gathered data from the scientific literature on dental characters and the functional traits they serve as proxies for in sharks. While the ongoing pandemic forced me to work from home for months on end, as it did for many of us at the FSBI, my use of a literature review mitigated this setback. From this review, I uncovered that a number of shark dental characters – for example height, width, serrations, lateral cusplets found on the sides of teeth, and shape outline metrics – have been linked to body size and diet as reported in the literature. To verify these relationships, I subsequently gathered an independent dataset of images of shark teeth from over 60 living species. From this, I recorded the dental characters independently (ie. Presence or absence of discrete characters or categorised measurements of height or width) and performed exploratory analyses on this dataset. The links I uncovered



A dwarf lanternshark *Etmopterus perryi*



The relationship between shark size, their diet and tooth width

in the review (ie. Height and width are well correlated to body size) were verified by these independent analyses. Significantly, this means I can use a combination of dental character measurements to construct a broad ecological profile of sharks. Given their similar dentitions to living sharks, it is thus reasonable that I can now apply this same approach to extinct sharks from the last 66 million years of evolution.

With the first year of my research behind me, the next step is to begin planning for travel to museums where I can collect

this same data from the teeth of extinct sharks. Furthermore, I have colleagues in my research groups that have gathered thousands of images of shark teeth that I can apply my review's approach to. This will serve as good mitigation should travel rules change again, as they rapidly do during these current times. But the hope is that my travels will be well timed as the world begins to open up again.

By collecting dental character data and inferring functional traits in extinct sharks, I can use those functional traits to understand the functional diversity of sharks

through time. These functional traits will be used as axes to reconstruct a dental morphospace, where I will be able to track how shark ecological roles changed over the last 66 million years. Most significantly, this will allow me to observe how shark diversity and ecology was affected by previous mass extinction events such as environmental shifts induced by climate change. This will give us the understanding we need of how sharks have been affected by previous mass extinctions, potentially providing insight into how their ecology may be affected by the threats they face today.

A note on Rosemary Lowe-McConnell



Rosemary Lowe-McConnell (1921-2014) was the first female recipient of the Beverton Medal. As described on the Society's website, the medal was named after former Society President and first recipient of the medal awarded in 1995. Ro, as she was known, was awarded it in 2000 at the summer symposium organised by Inigo Everson on polar fishes at Cambridge. Recently the Linnean Society has highlighted a gift to the society from Ro, bequeathed

when she died, of three medals one of which was her Beverton Medal. Ro was Vice-President of the Linnean Society in 1976-77. The other two medals were the Linnean Medal awarded by the Linnean Society for her work on African and South American fishes and the Naumann-Thienemann Medal awarded by the International Society of Limnology.

Thanks to Will Perry for drawing this news to my attention (Ed).

BASS Bursaries in the memory of Donovan Kelley and Graham Pickett



Donovan Kelley on a fishing day

Within the annals of bass study and bass science the name of Donovan Kelley stands out as perhaps the most notable figure. Donovan is often regarded as the leading light and authoritative source of much of what we now know of bass biology and behaviour and for which he was so rightly awarded an MBE in 1991. Donovan, who died in 2008, authored two books, wrote many articles for the legendary *Angling* magazine from 1949 and he subsequently published 9 scientific papers on bass spawning and migration, feeding and growth and strong year class theory through the Marine Biological Association.

In the early 1970's Don began a 5 year tagging study on adult bass on Anglesey, journeying from his home in Plymouth and back again over many 'holidays' and weekends and was often assisted by his wife Betty. In 1981 he began his research into first year bass (0-group) abundance, growth and first-winter survival rates in estuaries of West Wales and moved on to assess juvenile and adult bass growth rates from sites in North Pembrokeshire, North Cornwall and Dorset and with the assistance of Bradwell charter skipper Bob Cox, he traced the migratory movements and growth patterns of bass in Essex waters.

Alongside all this work, Don's interest in statistics (he was an auditor by profession) and his deep

fascination for bass as an angler, enabled him to compile records of big bass captures from 1947 to 1996. Based on reports published in sea angling magazines and club records he also listed the most successful big bass baits from 1937 through to 1997. These are reproduced as tables in his second book *Life with bass* and make fascinating reading. Don's bass studies were the epitome of what we today call 'Citizen Science' and his work on bass involved collaborations with over 400 amateur volunteers and members of the scientific community alike.

In *Life with bass* Don also recounts how, during one of his short bass tagging visits to Wales, a chance meeting on the high street of a little Welsh village, with a lady asking him for directions where to buy milk, lead to a meeting with a marine scientist with a kindred interest in bass.



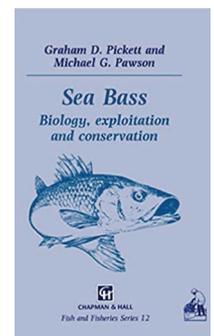
Graham Pickett at Belan

The lady in question was the wife of Graham Pickett, who was just about to start a new job at the MAFF laboratories at Lowestoft with Dr. Mike Pawson and so, as Don writes, '*It was another of the remarkable coincidences which have illuminated my fishing life*'. Like Don, Graham was an accomplished bass angler, and coupled with his scientific interest in bass they formed an immediate friendship and, but for that chance meeting, the body of work on bass that they produced over the following 25 years would

not have been so thorough and encompassing.

This year marks the second anniversary of his untimely death and those in the angling and scientific communities who knew him and worked with him remember him with fondness and deep respect.

Graham co-authored *Sea Bass: Biology, Exploitation and Conservation*, regarded as the definitive and most comprehensive description of *Dicentrarchus labrax* and he and co-author Dr. Mike Pawson became the defacto expert scientists on bass. He was also central in setting up the BASS scale survey, teaching members how to read and age bass scales.



BASS has now set up two bursary funds, to the memory of Don and Graham, in recognition of their lifetimes' work on bass, which has formed the foundation of our collective knowledge of what many believe to be the favourite sea fish amongst sea anglers. The Society has decided to allocate funds in order to offer financial assistance to individuals or groups involved in research on bass biology; for students, this would normally be at postgraduate level. Each award will usually be for the sum of £1,000, although the Society may increase this to £5,000 at its discretion. These grants will be respectively known as:

The Donovan Kelley Memorial Bursary and The Graham Pickett Memorial Bursary.

Those wishing to learn more about the scheme, or apply for funding, should visit the Bass Anglers' Sportfishing Society website www.ukbass.com, under the Science Group tab, and click on the Bursary Awards link.

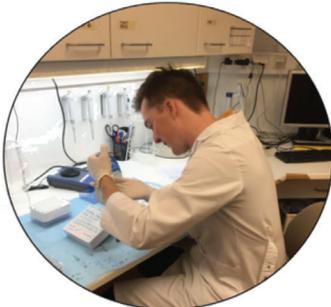
COP26 Video Series

With the arrival of COP26, it is appropriate that the FSBI joins with other societies worldwide to remind our national representatives of the importance and urgent need for action on climate change and thus the importance of COP26 to our future and to that of the natural environment. Last year, the FSBI, along with 110 global aquatic scientific societies representing 80,000 scientists, supported the American Fisheries Society (AFS) and its statement on climate change. This year, with COP26 being hosted in the UK, our President, Professor Colin Adams, wrote to the Rt Hon Alok Sharma, the President of COP26 and to Mr Nick Bridge, the UK Special Representative for Climate Change on behalf of the FSBI to add our voice to those emphasising the importance of COP26 and its outcomes. In addition to this, we have been working with our members to highlight some of the vital research that is being carried out to better understand the impact climate change is having on fish, in a new COP26 video series:



Dr Daphne Cortese, *Institute of Biodiversity, Animal Health & Comparative Medicine, University of Glasgow*: Daphne's research focuses on the impact of climate change on reef ecosystems, and particularly anemone fish. Enjoy the beautiful videography, while absorbing the poignant message of what impact climate change is having on the world's fishes.

<https://youtu.be/DSNwTeDAbss>



Daniel Ripley, *Division of Cardiovascular Sciences, University of Manchester*: Daniel's research focuses on the impact of climate change on organismal physiology, and particularly shark embryos. Learn more about the intimate effects climate change is having on shark embryos, from their size to predator avoidance behaviours.

<https://youtu.be/6SjD646UWtE>



Dr John Pinnegar, *Centre for Environment, Fisheries and Aquaculture Science (CEFAS)*: John talks to us about his research into areas such as climate change and fisheries policy, shifts in species distribution, winners and losers (in terms of species) of climate change, climate change risk assessment of fishing fleets and storminess.

<https://youtu.be/ywKp7MRo7is>

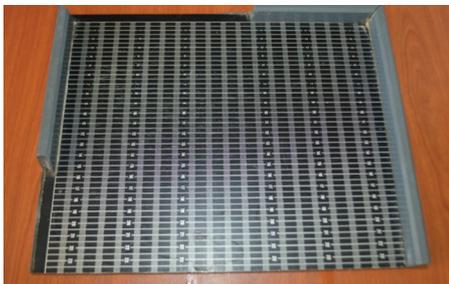
Two interesting notes from Inigo Everson

When Inigo Everson was president of the FSBI he asked if I would be interested in editing this Newsletter. Since then, he has occasionally sent me items that might be of interest and I am ashamed to say that I then forget about them when assembling an edition – sorry Inigo.

To rectify the situation I include here two items that Inigo has sent, one from 2019 and one from earlier this year.

Ways of measuring small fish

Inigo writes: “During a recent visit to Lake Victoria the local scientists were using the fish measuring tray in the attached photo. It is extremely easy to use and you can line up a lot of small fish on it and take a photo for subsequent estimation of length frequency. Originally the ‘frame’ went all round but, with the passing years, bits have dropped off.



It is ideal for the project I am setting up on the Lake for sampling small fish (dagaa – *Rastrineobola argentea*, haplochromines and young of the year Nile perch). Strange as it may seem I can’t find it on the web to purchase. It has no maker’s name but looks as though it was produced in reasonable numbers. Have you seen one and, more importantly, do you know a supplier?

The experience on Lake Victoria made me realise how useful it was for measuring samples of small fish. It would also have been great for krill a few decades ago (Inigo worked at the British Antarctic Survey and was a krill

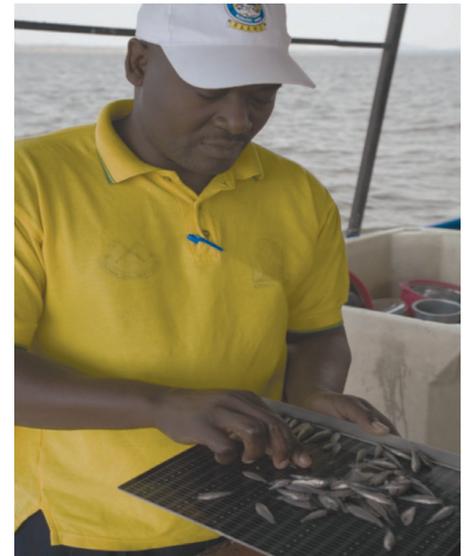
specialist). It looked as though the FBA or some other organisation might have made it but there are no manufacturer’s marks at all to help. Unfortunately I am looking for something that can be used on a kapenta rig (a type of fishing gear for catching dagaa) fishing raft at night on Lake Victoria so there are a number of constraints that need to be taken into account. (I’m thinking very carefully about such situations as I prepare the Risk Assessment for the project!)

Readers of the Newsletter, might be able to identify a potential supplier or even provoke comment from an older generation who did much of their sampling hand-a-matically. Attached is a photo, taken in 2007, of a similar pattern measuring board (owned by the Tanzania Fisheries Research Institute) in use on one of my earlier Lake Victoria acoustic surveys. Apart from the project I am planning, the Ugandan National Fisheries Resources Research Institute would like to be able to obtain additional measuring boards to take on their visits to the other Ugandan lakes so there is a market, albeit pretty small”.

I suspect that this plea for help might now be redundant, given the time that has passed since Inigo sent me the email, but it might help others who work in areas where small fish are abundant and need of measurement.

Re-introducing Twaite Shad to the River Severn

A further email from Inigo in June 2021 reads as follows: “A recent BBC Radio 4 Farming Today (I think) mentioned the construction



of a new fish pass on the Severn to allow Twaite Shad (*Alosa fallax*) to migrate to their spawning grounds. That seemed to be some good news, particularly if you are a Shad. Coincidentally, on reading my weekly comic The Economist I came across the attached Lexington article.

Seen together, these two articles show some trans-Atlantic commonality that might perhaps be highlighted in the FSBI Newsletter. AFS must have had some influence on the Economist article and likewise I assume that IFM might for the Severn story.

I’ve never seen a Twaite Shad and know only of it through my Observer’s Book and Travis Jenkins both of which suggest that the species does not migrate very far into freshwater so wonder why the emphasis on the Severn fish pass. Consequently I would not be a reliable reporter on the species”.

This last item is most apposite in the light of the Fish Migration Day announcement under ‘Notices’.

Anyway, thanks to Inigo Everson for two informative items.

40 United States

The Economist May 8th 2021

Lexington | A shad state of affairs

The Potomac river is a more vivid symbol of American history than any of the monuments along it

Notices



You are invited to join the 5th global celebration for migratory fish and healthy rivers!

We are preparing the 5th World Fish Migration Day on **May 21, 2022!** An amazing milestone and we are super proud that we got to this point. We hope you are joining up too to raise awareness and help save migratory fish and free-flowing rivers. The WFMD2022 is organized in close cooperation with WWF, TNC, University of Nevada, IUCN Freshwater Fish Specialist Group, Dutch Angling Association. More than 100 organisations have become our partner and help us to create impact. And what's truly special is that more than 4000 organisations were involved in organising events over the past years.

We will celebrate a truly special [World Fish Migration Day 2022](https://www.worldfishmigrationday.com), (<https://www.worldfishmigrationday.com>) with our new **BREAK FREE** campaign! We have received news from many past participants already, letting us know what they are planning for their next event. In the following months we will be sharing all of this news and more in our WFMD newsletters and social media

channels. You can receive our monthly newsletters by signing up.

We are excited to let you know about several important things:

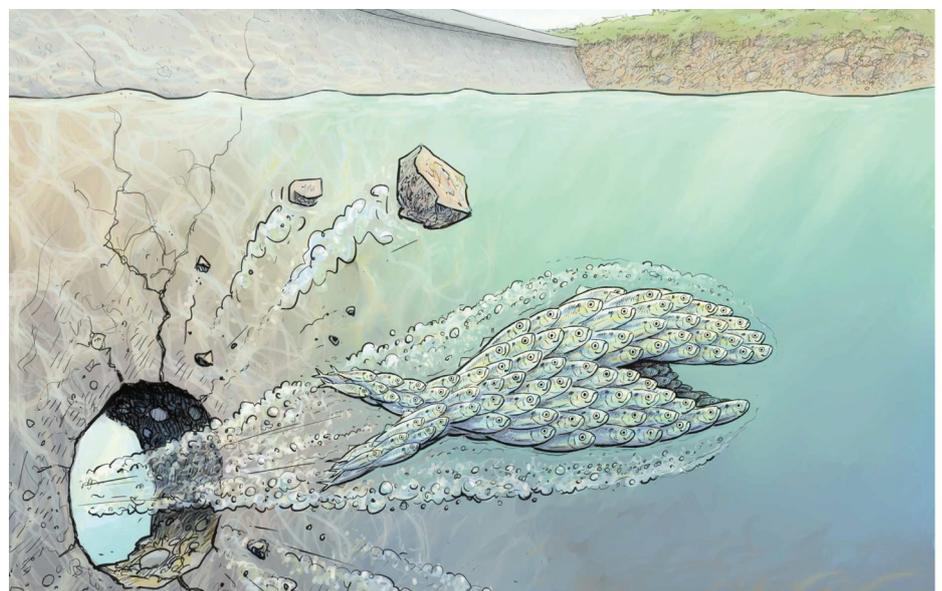
- **Event ideas and guidance:** we have attached our updated participant guideline which also gives an overview of event ideas from the last years. We have seen so much creativity over the years. Just take a look and we hope it inspires you to join too.
- We have a completely new website! You are welcome to explore the new features and [REGISTER YOUR EVENT!](#) You can do so even if you do not know any details yet. A personal event account will

be created automatically and you'll be able to update your event at any time.

- We started a **global petition** where all organizations are encouraged to sign and support. We already have 330 signatures from 72 countries! Please sign the petition and help us spread it throughout your networks!
- We have a new WFMD events coordinator! Her name is Elena Cebrián Alfaya, and you are welcome to contact her with any questions at Elena@fishmigration.org.
- We are working on the [EuroFishion2022](#) song contest and a Fish Flag Art competition with our partner Wildlife Forever! This year there will be some very special prizes, so stay tuned!!!

We would like to please ask you to **share this invitation message** with all of your networks and media channels (when possible). We know that with your help, we will reach the whole planet!!

On behalf of the WFMD Team,
Herman Wannigen, Director World Fish Migration Foundation and LeCren medallist 2020.





Third Call: Fisheries Society of the British Isles Postdoctoral International Travelling Fellowship Grants (PITF) 2022

The FSBI is pleased to invite applications for our established research funding opportunity: *FSBI Postdoctoral International Travelling Fellowships (PITF)*. The scheme is to support outstanding postdoctoral scientists to undertake research in line with the [objectives of the FSBI](#), and that benefit from international mobility and expertise and/or facilities of the chosen host. The research can comprise experimental studies, development/validation of a methodology, fieldwork,

or related activities within an existing programme of activity. The research will require sufficient coherence to generate explicit quantifiable outputs and with a demonstrated benefit(s) to the career development of the FSBI Fellow. Two PITFs are awarded each calendar year: **Incoming PITF**, hosted within an appropriate University, research body or industrial partner within the British Isles, and an **Outgoing PITF**, hosted at a suitable institution globally. Each FSBI Fellow (PITF) can apply for up to £20,000, to include travel, subsistence and accommodation, and eligible research costs, over an approximate duration of 3 months. Log into [mySociety](#) to download the FSBI PITF Application Form and see the full Terms and Conditions. For further enquiries, please contact the FSBI Administrator, Jane Smith (j.p.smith@bangor.ac.uk). The PITF are coordinated by a committee of three FSBI Council Members (currently, Katie Longo and Willie Yeomans), and chaired by the Hon. Past President (currently, Professor Gary Carvalho).

Closing date: The closing date for applications to be submitted online via the FSBI website is 17.00 (GMT) 24th February 2022. Interviews (in person or via skype) will depend upon applications received in each round, and with advance notice to secure availability. The outcome is expected by the end of March 2020, and following a period of negotiation, for Fellowships to commence from May 2022 onwards.

Information Desk

For all membership enquires please contact the FSBI office at:

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See <https://fsbi.org.uk/membership/> for further information.

Secretary: Dr Ian Winfield

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