

Unexpected connections. Fish biology and football linking two landscapes

Paul Hart

Since the beginning of September I have been working in the Department of Biology at Karlstad University in Sweden. For many of my Swedish colleagues their knowledge of the location of Leicester, UK, where I normally work, is a bit vague. To orientate them all I have to do is mention that Sven-Göran Eriksson manages the Leicester City Football Club and they show a flash of recognition. This comes from a fact most non-Swedes are unlikely to know, which is that Eriksson, or Svennis as he is known in Sweden, grew up in Torsby, a small town in the centre of Värmland, one of Sweden's historical provinces of which Karlstad is the administrative capital. Värmland extends from the northern shores of Sweden's largest lake, Vänern, and in the 18th century was the centre of Europe's iron industry.

Karlstad University has a group of researchers in the Department of Biology, lead by Professor Larry Greenberg and Dr Eva Bergman, specialising in the ecology of fish in running waters. The city's location on the north shore of Lake Vänern makes it well placed for studies of fish in rivers and of course in lakes. The largest river in the area is Klarälven, which starts its run in Norway and finally enters Lake Vänern at Karlstad. The city is built on its delta and at the northern end of the town, the river splits into an east and west branch which surround the town. The river has a population of salmon that are landlocked, only migrating between the river and Lake Vänern. The river



Karlstad University's library early on a November morning.

has been dammed in 9 places to create hydropower stations and this has made it impossible for the salmon to migrate to their usual spawning grounds. To mitigate this salmon ready to spawn are taken by truck to locations far upstream for release and eventual migration back down to the lake. In addition smolts are reared in a hatchery and then released downstream of Forshaga to migrate into the lake. The hope is that these will return to this location from where they will be given a lift upstream by truck. Some of the research done by the Karlstad group has investigated survival of those wild migrating smolts still in the system as they move downstream and through power station turbines.

Lake Vänern has about 100 commercial fishers who work on the

lake catching a variety of species, with salmon being the most valued. Another important species is a fish called siklöja in Swedish or vendace in English (*Coregonus albula* in Latin). This species is caught for its roe. The fishery takes place in October and November but this year November has been so cold that the lake has frozen early and the fishery period reduced by half. The roe is a great delicacy and is served with toast, finely chopped red onion and chives and sour cream.

Compared with one hundred years ago, the lake fishery is far less important to the economy of the region and to local food supplies. The small Hammarö Skärgårds Museum (Skärgård = archipelago)

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Unexpected connections. Fish biology and f



Karlstad seen from the south west with a bay of Lake Vänern, frozen over enough for skating.

on the Vänern delta gives an account of the fishery as it was. People around the lake made use of a wide range of species, even drying and salting pike and roach, which was a staple food item. Jan Selling in a delightful little book called *Långsam fisk (Slow fish)* describes how roach could be dry salted overnight and then hung out to dry in the sun. One local is quoted as saying that he eats the dry salted roach as it is with a cold beer. As the picture illustrates, dried roach hardly looks appetising but then these fillets have been in the museum a long time!

The fish research group use a mix of fieldwork, field and laboratory experiments to answer questions about the Salmonids living



Salted and dried roach fillets in the Hammarö Skärgårds Museum

in the area's rivers. A great deal of their research is funded by power companies responsible for hydropower production and the problems to be solved derive from the effects of that industry on the local rivers. The Department is well equipped with boats, electric fishing gear, nets, current metres and the like for field work.

In the basement of the building housing the department is a superb aquarium facility with four 7 m long stream aquaria and ample space for tanks of varying dimensions. The temperature in the stream aquaria can be regulated from about 5°C upwards yet the room itself has underfloor heating so is comfortable to work in at all times. The lighting can of course be regulated and it is possible to have a dawn and dusk period when the lights are raised or dimmed over a half-hour period. More details, although in Swedish, can be found at

<http://www.kau.se/biologi/akvarieanlaggning>.

Using these facilities Larry and Eva, research associates Olle Calles, Jack Piccolo and Martin Österling, a postdoc Jurate Lesutiené and six PhD students,

Linnea Lans, Pär Gustafsson, Johnny Norrgård, Douglas Jones, Stina Gustafsson and Johan Watz answer questions about the behaviour and ecology of stream dwelling fish. For example, Pär Gustafsson has been using the stream aquaria to explore the influence of sunken wood on the space use and feeding behaviour of salmonids. Johan Watz and Jack Piccolo have examined how temperature influences the feeding behaviour of drift feeding trout. Johan is going to be doing a similar study with grayling, another common species found in the rivers and lakes of the region.

Most of the research work done at the University is at the interface between ecology, behaviour and the mitigation of the effects of human activity on the river ecosystems. At present the group does not work on the lake fish or fisheries although this is an area for future expansion. At 5,600 km², Lake Vänern is the third largest lake in Europe and it contains a diverse fish community. This community supports good commercial and sport fisheries but the amount of research devoted to the fishery is less than needed for the proper management of the resource.



The upstream end of a stream aquarium with grayling

The main aspect of life in Karlstad over the last month of my stay has been the cold and snow. Snow first fell on 10th November but then melted. It returned about 15th and has been here ever since. Through November the temperature has gradually fallen so that

Football linking two landscapes – continued

temperatures down to -20°C have not been uncommon. Everyone tells me that this is not normal for this time of the year and it is amazing how the experience of this cold can make -1°C seem like a summers day. As mentioned earlier, the cold cut short the fishery for siklöja. It also caused the Klaräven river to almost freeze over as it flows around Karlstad, a phenomenon I have never seen before. The trouble is, returning to the UK for Christmas will probably not mean a relief from the cold.



The nearly frozen Klaräven with the new conference centre to the left and Sweden's longest stone bridge at 168 m and built between 1761 and 1811.

EDITORIAL

By the time this edition of the *Newsletter* is distributed Christmas will be over and we will be into 2011. I hope that you have had a good break and are ready for whatever 2011 brings.

As described by the President in her piece and by the Vice-President in his, 2011 will bring significant changes to the Society. Probably ever since its inception, the Society has focussed on serving the fish biology community and there has been an overt shunning of the more applied aspects of fishery science. The introduction of the briefing papers, pioneered by Nick Polunin, was the first move in an attempt to engage more with the world beyond research. At the time there were members of Council who thought that the Briefing Papers were a waste of the Society's money but I hope that by now those who protested will see that they have been a great success.

The new undergraduate internship scheme is an excellent attempt at reaching out to young people at a stage of life where their final goals are not entirely fixed. Internships might well inspire students to decide to go on to do a PhD, perhaps making use of the Society's graduate grants.

Perhaps the biggest change is being brought about by the Society's decision to organise the 6th

World Fisheries Congress. Deciding to do this was a daring move as such an event carries both financial and reputational risks. We must be grateful that in Felicity Huntingford and Mike Kaiser we have two hard working and inspirational leaders, who will deliver a first rate conference that is bound to supersede all its predecessors. Those of us living in the UK will have the Olympics in mind for 2012 and will hope that they are a success. There is no doubt in my mind that, as Mike Kaiser calls them, the Olympics of the fisheries world will be just as successful. The appointment of a Publicity Officer should ensure that more than a few fish biologists notices the success of the WFC. As a Society we need to use the opportunity to engage with the public and persuade many that they need to think about the fish they eat and do their bit to influence how fish are caught and managed.

I wish you all a belated Happy Christmas and all the best for the New Year.

Paul Hart
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Karlstad/Leicester December 2010

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What the FSBI did next

At its meeting in April 2010, FSBI Council started discussing how the Society might extend the range of activities through which it currently works to realise its mission, which is to encourage, promote and support all branches of fish biology and fisheries science and conservation. Council continued this discussion at its December meeting, concentrating on activities that will, in one way or another, raise the profile of the FSBI and its activities.

Arrangements for the 6th World Fisheries Congress: Hosting such a large meeting as the 6th World Fisheries Congress in Edinburgh in May 2012 is a new venture for the Society and the organisation is being carried out in association with Congrex, a professional conference organiser. The event will be held at Edinburgh's International Congress Centre, which is a truly spectacular location. The scientific and industrial programme of the congress is being developed by an international committee chaired by Mike Kaiser; you can read elsewhere in the Newsletter his report on how this exciting programme is shaping up. The definitive programme and the call for registration and submission of abstract will go out in April/May 2011. The logistics of the meeting are in the hands of a local committee, working closely with Congrex. The committee comprises myself as chair, Mike Kaiser for liaison with the programme committee, Ian Winfield as Treasurer, Inigo Everson in charge of sponsorship, Ian McCarthy in charge of the satellite programme, Kath Sloman in charge of the special programme for students, Paul Hart in charge of publications, John

Pinnegar as advisor on sponsorship and liaison with CEFAS, Ian Dolben for advice on industrial contacts and on career development, Bill Turrell for liaison with Marine Scotland and Eamon Murphy for liaison with the Scottish Government. The work of the Local Organising Committee is going well and the pace is increasing. I am extremely grateful to everyone involved. There is to be a social programme including a variety of half-day and one-day trips in and around Edinburgh, several receptions and a congress banquet. Such events form a very important part of a successful conference and we are looking for someone to help with the organisation of this social programme. If anyone would like to volunteer, they should contact me at F.Huntingford@bio.gla.ac.uk. We also hope that as many members of FSBI as possible will support us by attending the meeting.

Appointment of International Guest Councillors: We already have several links with sister societies and organisations in other countries. For example, Presidents of FSBI and the American Fisheries Society exchange visits to the annual meetings of each others' societies and there is an exchange scheme in place for students from the FSBI, AFS and Australian Society for Fish Biology to attend the annual meetings of all three societies. There is still scope for much greater international collaboration and to help exploit this, the FSBI has invited Victoria Braithwaite (Penn State University) and Culum Brown (Macquary University, Sydney) to serve on Council as International Guest Members linking us to North America and

Australasia respectively. We hope to extend this scheme to other parts of the world. Victoria and Culum are charged with promoting the FSBI, keeping FSBI members informed about what is going on in their geographic area and promoting collaboration between the FSBI and organisations in these areas with similar aims to our own. Victoria and Culum attended Council in this capacity for the first time at our December meeting and came with a number of excellent ideas, many focused on promoting participation of young scientists, which leads on to FSBI's next initiative.

Organisation of an internship programme for undergraduates: Recognising that recruiting young people is essential to the health of any discipline, the FSBI welcomed a suggestion by Ian McCarthy that we should instigate an internship scheme to allow undergraduate students to carry out supervised research work in fish biology, fisheries management or conservation for a couple of months in the summer. The aim is to give young people valuable work experience, as well as a taste of what it is like in the business. We plan to start this scheme next summer (2011) and details will be posted on the website and published in the Newsletter. This is a very exciting initiative and I would like to thank Ian for setting it up and for being prepared to run it for the Society. The scheme would initially be based in the UK and Eire, but the hope is to extend it to include North American and Australian institutions.

Appointment of a Press Officer: Council are aware of the fact that,

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Scotland the centre of World's biggest fisheries conference in 2012

In May 2012, the Fisheries Society of the British Isles will host the 6th World Fisheries Congress in Edinburgh UK. This is the world Olympics of fisheries science and occurs only once every four years. The last event was held in Yokohama, Japan, and attracted over 1600 delegates. We anticipate approximately 2000 delegates given the location and its particular appeal to North Americans and ease of access from Europe.

Although typically a rather focussed and pure science meeting, this meeting will be different. Scientists are usually good at identifying problems with world fisheries, but a core theme of this meeting will be to address the solutions to moving us towards sustainable fisheries. The overarching theme of the meeting is 'Sustainable fisheries in a changing world'. The title is apt given the rapidly changing global climate with its associated issues such as changing weather patterns, species distributions and ocean acidification. The meeting also coincides with the reform of the Common Fisheries Policy in Europe and this will be addressed with a dedicated session. We will address aquaculture as well as wild capture fisheries, freshwater fisheries, socio-economic issues,

life cycle analysis, fisheries governance, ethics and fish welfare, to name but a selection. The programme is developing rapidly as this article goes to press. We would like to see a large representation of catchers, processors and retailers attend and participate in the meeting, which previously has been dominated by scientists. Despite decades of an increasing burden of fisheries legislation, it appears that initiatives sparked by participants in the supply chain have had the most effective outcomes in moving towards sustainable fisheries. These initiatives have often focussed on the principals sustainable fisheries as defined by the Marine Stewardship Council and have led more recently to concerted efforts to eliminate Illegal, Unregulated and Unreported fish products finding their way into the food-chain. Horizon scanning issues such as fish welfare in commercial fisheries will be of interest to retailers, especially as good welfare equates to better quality products. The meeting will bridge the science/end-user divide, but more importantly will expose scientists to what end-users 'need to know'.

In addition, we want to engage the general public more widely.

These science events often go unnoticed beyond the 'ivory tower' and fail to reach out to a wider audience. We hope to hold a public evening event that would involve, perhaps, a well known TV chef, perhaps a BBC science presenter and the rarest of creatures, a plain talking and public friendly scientist. The idea is to get the public thinking about which fish or shellfish products to buy in relation to its provenance. This is an exciting and new departure for this event, and we invite members of the fishing and aquaculture industries, stretching from the net to the plate, to approach us with ideas and to get involved.

Michel Kaiser

Contact Michel Kaiser at michel.kaiser@bangor.ac.uk

Professor Michel Kaiser has expertise in marine fisheries and aquaculture, and is based at the School of Ocean Sciences, Bangor University, UK. He is the Chair of the International Programme Committee for the 6th World Fisheries Congress and sits on the board of the Seafish Industry Authority which serves the seafood industry in the UK.

President's Piece – continued

outside the FSBI itself, we do not seek publicity for the wide range of extremely valuable work carried out by the FSBI, mainly because members of Council and its office bearers are all very busy. We decided that the FSBI should do a little discreet boasting and would like to appoint a Publicity Officer, whose job would be to find ways

of publicising all the Society's activities, both among the scientific community and to the general public. The Publicity Office would be expected to attend Council meetings and to keep abreast of all the societies activities, and comes with an honorarium of £2,500. If anyone would like to volunteer for this position, please

contact the honorary Secretary, Brain Eddy at F.B.Eddy@Dundee.ac.uk.

Felicity Huntingford
University of Glasgow
13th December 2010

Notices

Nominations for the FSBI Medals, 2011.

Each year, the FSBI awards three medals for life-long individual contributions to fish biology and fisheries science. These are:

The Beverton medal is awarded to a distinguished scientist for a lifelong contribution to fish biology and/or fisheries science, with a focus on ground-breaking research.

The Le Cren medal is awarded to one or more individuals who have made a lifelong contribution to fish biology and/or fisheries science, with a focus on conservation, training or public understanding of the discipline.

The FSBI medal is awarded to younger scientists who are deemed to have made exceptional advances in the study of fish biology and/or fisheries science in recognition of their achievements. Nominees must be under 40 years of age on 28 February of the year in which the medal is awarded.

FSBI members are invited to nominate candidates for these three medals. These should be sent to the Honorary Secretary (F.B.Eddy@Dundee.ac.uk) no later than 11th February 2011. Details of how to do this are provided on the society's website (FSBI.org).

The Fisheries Society of the British Isles (FSBI) call for PhD Studentship applications 2011

The Fisheries Society of the British Isles (FSBI) offers up to two competitively awarded MPhil/PhD studentships annually. FSBI Studentship awards are based on PhDs funded by the Natural Environment Research Council (www.nerc.ac.uk) and cover the costs of the stipend (NERC rates plus £1000, London weighting of £2000) and of the annual registration fees (at EU citizen rates), with a small annual contribution (£1,250) towards project expenses. Research projects are proposed by the candidate and may be in any field of study relevant to fish biology and the aims of the Fisheries Society, as stated at: <http://www.fsbi.org.uk>. This includes projects in which fish are the study species as well as those that examine the influence of non-fish taxa on fish biology, e.g. the effects of infectious agents on fish health, of fish-eating birds on fish populations, of invasive crayfish on fish behaviour. However, the focus of the research must be fish biology, and the FSBI reserves the right to decide on the suitability of proposed research topics for its awards.

Applicants should hold a Bachelor's degree, with first or upper second class Honours, in a subject relevant to fish biology, normally in the biological sciences. An alternative combination of qualifications and experience that clearly demonstrates equivalent knowledge and ability may be considered at the discretion of the FSBI Studentship Committee. Applicants will be expected to be members of the FSBI and the successful appointees will be expected to remain as FSBI student members for the duration of their funding.

Applicants should develop the proposal in consultation with the proposed supervisor(s), one of which must hold an academic position at any institution of higher education in the British Isles (including the Republic of Ireland). However, the application form and project proposal **MUST** be written and completed by the APPLICANT, not by the proposed supervisor(s). Applicants may hold any nationality, but FSBI Studentships are fixed at rates applicable to UK/EU citizens, and any registration fees above the base rate (currently about £3,750 per annum) must be justified in the application. The FSBI Studentship Committee will consider applications from non-UK/EU applicants, but the FSBI will cover the fees at the UK/EU rate only, so the application must include proof in the application that the financial means are available to cover the additional registration fees charged to non-UK/EU citizens.

The closing date for applications is **11th January 2011**. Selected applicants will be interviewed at the end of February.

For further details and a downloadable application form, please refer to the FSBI studentship webpage <http://www.fsbi.org.uk/studentships.htm>. Please note that applications are limited to one per applicant. Informal queries about the application submission process may be addressed to Gillian Ashall (grants@fsbi.org.uk), with subject-related queries directed to the Committee Chair, Dr. Ian McCarthy (i.mccarthy@bangor.ac.uk).

Merging our deeper currents

a report from the 2010 American Fisheries Society meeting

Victoria Braithwaite, Penn State University, USA

In September 2010 the American Fisheries Society (AFS) held their annual conference in Pittsburgh, Pennsylvania; a city with historical influence and wealth owing to the 19th and 20th century steel magnates that included Scottish-born Andrew Carnegie. The theme of this year's conference was 'Merging our Deeper Currents'. Over a thought-provoking week, the society provided a balanced mix of mini-courses, talks, posters and the traditional social events. Despite a slightly smaller enrollment than usual – presumably a consequence of the economic pinch that we have been experiencing on both sides of the Atlantic, those that did attend had a stimulating time and overall the event was very successful. FSBI made an early entrance – with an interest in fostering new links, we arranged for brochures highlighting the society to be part of the initial 'Welcome' conference pack. The new brochure, if you haven't seen it yet, is an attractive and colourful summary of the society, and I am sure many of the delegates will have read about who we are and what we have to offer.

The meeting began with four thought-provoking plenary talks that I summarise here. The first, delivered by Professor Ian Cowx from the UK's University of Hull, introduced the idea of conservation and management in the 21st century. Although he focused on the problems that we have to tackle now and in the future, encouragingly he celebrated the resourcefulness and innovation of those currently taking on such challenges. He was, however, stern and critical of the fact that many different efforts are made but precious few are truly validated. The result, he complained, is a poor understanding of which projects *actually* make a difference. He described the importance of many different fisheries – from commercial to recreational, emphasizing how we must conserve and protect these important resources that now face more threats than ever. He stressed the need for us to carefully manage the environment and the

waters required to sustain fish populations, and he warned that on too many occasions we fail to respond quickly enough so that the action we take is often just too late. It was a sobering opening to the meeting.

The second plenary made the transition from management to policy. Dr Jane Lubchenco, a marine ecologist with an impressive list of previous administrative positions, now heads the National Oceanic and Atmospheric Administration – more familiarly known as NOAA. She had her hands full as she presented her talk, as head of NOAA she has been intimately involved in helping to assess and manage the grave consequences of the BP oil spill in the Gulf of Mexico. She spoke of how to make policies work, the need to educate both politicians and the public about marine resources, and how to move from science to legislation. She touched on overfishing and considered how to create realistic quota systems that are workable and that promote an increasing economic return whilst decreasing the environmental impact. Is that possible? Lubchenco believes that with the right policies and administration in place, yes it is. Just two days after her talk in Pittsburgh Lubchenco was back on the front pages of the US national newspapers facing the latest Deepwater Horizon crisis. With so much crude oil dispersed within the Gulf, it seems likely that she will be busy for the foreseeable future.

Larry Schweiger, president and chief executive officer of the US National Wildlife Federation presented the third plenary. His recently published book '*Last Chance: Preserving Life on Earth*' (Fulcrum Publishing, 2009) formed the framework for his talk. It was a moving summary of how we need to act now if our children and our grandchildren are to inherit a world with some semblance of biodiversity. He summarized the impacts of increased levels of CO₂ emissions and climate change on many different ecosystems, and explained the urgent

need to build or help create resilience within such systems. On the scheme of things this theme might seem a well trodden path, but don't forget that the average North American has a shockingly large carbon foot-print and manages all too often not to pay attention to the consequences of climate change. The presentation delivered by Dr Schweiger made it hard for anyone to ignore his warning.

A relatively junior member of the American Fisheries Society, assistant professor Melissa Wuellner from South Dakota State University, was invited to present the final plenary talk. She was an inspired choice. Being a relatively 'new kid on the block' she was ideally placed to analyse why societies, such as AFS, are losing members and finding it increasingly hard to recruit. A worrying trend currently familiar to many societies. In preparation for her talk she had surveyed different student groups, and the results were interesting. Much of the action she recommended would take rather little to implement. It seems that the next generation are hungry for involvement, they want to have a niche where they can contribute to the society's aims and objectives, and they are keen to learn new skills that will help them with their careers. FSBI could consider adopting some of these ideas, for example, having a graduate student representative on Council would be one way for our younger members to have more of a voice. Tied in with our annual conferences, a day could be used to offer students training – different topics could be tackled in different years. For example, we could use workshops to provide advice on how to write successful papers or grants, how to referee manuscripts or how best to seek out post-doc or faculty positions. A number of societies already run similar kinds of training opportunity and it would seem that adding an additional student-focused day onto the FSBI annual meeting might provide an attractive lure for prospective student members.

Travel Grant Report

Laura Martinez, who is a PhD student of the Nutrition group of the Institute of Aquaculture from the University of Stirling, expresses her gratitude to the FSBI for the Travel grant that allowed her to attend to the 14th International Symposium on Fish Nutrition and Feeding, held in Qingdao (China) in June 2010.

This international conference, which meets once every two years, hosted researches from all of the most important research groups working in Fish Nutrition all over the world. There were more than one hundred oral presentations and around three hundred and fifty poster presentations dealing with a broad range of topics including Cellular and molecular nutrition, Nutrition and health, Feed processing and feeding, Alternative feed sources and Physiological metabolism.

It was my first international conference and I had the opportunity to present part of the results from the first trial of my PhD in a poster presentation entitled "Transcriptomics (oligo microarray) to assess the effects of different diets on gene expression in heart skeletal muscle inflammation virus infection in Atlantic salmon". The use of functional diets designed to improve the incidence of some inflammatory diseases is the main subject of my PhD and the use of biomolecular analysis to assess how different diets modify the immune response against a viral infection is something quite new so I had the opportunity to discuss my work with other researches and get a quite good feedback from them.

I also had the opportunity to meet researchers working in fish nutrition around the world and

people from the most important feed companies that I hope will help me find a Post-doc position or a job as a researcher when I finish my PhD.

But this experience was not only great for my PhD but also to meet the Chinese culture which is so different from the European: I tasted a great variety of Chinese food and improved my use of chopsticks; I learned how to bargain every time you want to buy something, how to cross the street, which is a challenge there, and a lot of little but amazing experiences that makes the conference not easy to forget.

So thank you very much to the FSBI, for giving me this great opportunity to attend such an amazing and interesting conference!

INFORMATION DESK

For all membership enquires (except subscription payments), including grant application submissions, please contact the FSBI office at:
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