EIGHTY-FOURTH

ANNUAL REPORT

OF THE

FRESHWATER BIOLOGICAL ASSOCIATION

and Accounts for the year ended 31st March 2016

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Approximately one third of the staff are employed on part-time contracts

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FBA News	Dr Jonathan Grey
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Foreword from the President

I am proud of the staff and Council of the FBA who have completed the reorganisation and continue to deliver a very high quality of performance in pursuit of our aims and objectives. We now need to move swiftly to deliver the benefits of the new management and scientific structures supported by the investment into membership services and marketing.

This is a time of almost unprecedented change. The major global trends of population growth, urbanisation and increasing demand for natural resources, complicated by climate change, continue.

At the same time, the decision by the UK following the referendum on 23rd June poses new and potentially very difficult problems. It is far too soon to explore how these might develop, but clearly much of our current environmental regulations stem from Europe and how that will develop in the future is a problem.

It is within this global and national context that we at the FBA need to stand guard against the excesses of freshwater environmental abuse, to offer solutions where harm has occurred and alternatives to protect freshwaters where required. Our cause is not lost and I believe we will overcome the challenges freshwaters face. The signals in freshwater ecosystems must be heeded; fresh water is an important resource which must be preserved and exploited sustainably.

The FBA must be fit for the future but heed the lessons taught to us by those who have gone before. We have lost a number of eminent scientists and practitioners in the freshwater field this year who have contributed much to our growing knowledge and archive. Especially Nigel Holmes whose archive is now secured for those freshwater scientists who will follow. Nigel will be much missed by those who knew and worked with him and by the environment that benefitted from his learned touch.

Report from the Chair of the Council

What a year! Every part of the FBA has experienced some form of change and we have certainly turned a corner. The direction is clear but the 'invest to save' ambition still has some way to go before we see whether the strategy is working. However it is with huge thanks from the Council to our Chief Executive and all the staff at the FBA for delivering the changes and keeping the day job going.

Council met twice in the year and, in line with the new way of working with the Chief Executive who is ultimately responsible for all operational day-to-day matters, meetings were kept to a minimum. The three sub-groups of Council for Staff, Estates and Governance respectively progressed performance management and the new pay structure; developed plans for converting the Annexe into holiday flats; investigated other opportunities for our estate and reviewed our governance by updating our Memorandum of Articles. This work is substantially complete and building work has now started on site. Council will now turn its attention to ensuring the investment made delivers the stable, financially secure organisation and leading learned society for freshwater we all want. To that end, I am keen to see the developing Science Strategy which will set out the work that we and others need to do to protect and improve our knowledge and remediation of freshwaters.

I am grateful to my colleagues on Council for their support, guidance and expertise in so many matters brought before us. I am confident that as we develop our commercial and marketing work, the commitment of a significant proportion of our reserves will be rewarded with a balanced and sustainable budget and a secure financial future overseen by Ron Middleton, Honorary Treasurer for Council. Ron has taken over the finance portfolio from Peter Andrewes who has stood down following a hugely influential contribution to the future of the FBA.

My best wishes to all freshwater practitioners, scientists, politicians, engineers and administrators; be assured the FBA is here to help focus action in the freshwater environment.

Report of Activities from the Chief Executive

This is my first full Annual Report as Chief Executive of the Freshwater Biological Association and a year of significant change for the organisation and one with significant challenges not least Storm Desmond, which brought unprecedented amounts of rain to Cumbria over the weekend of 5-6 December 2015.

Much of the first part of the year was spent being internally focussed. Council tasked me with implementing a new organisational structure, including changes to roles and responsibilities to enable the delivery of our Strategy, and a new Business Model and Plan.

This has been achieved by:

1. Aligning resources to the new strategy and Business Plan;
2. Providing clear leadership and accountability;
3. Promoting efficient and effective working;
4. Equipping the organisation with the capacity, knowledge, skills and experience required to deliver the aims and objectives of the FBA.

The new FBA organisational structure has established:

1. A Senior Management Team led by the Chief Executive who is accountable to the Council for the Organisation's performance and operations;
2. Three clearly defined Departments, Business, Science and Corporate Services, each with a separate function, but closely aligned to support each other in pursuit of strategic and operational objectives;
3. Accountability for delivery of work through the reporting lines and individual work programmes.

The new structure and operations came into effect on 1 July 2015. Change is always challenging, but I strongly believe that this re-organisation was essential to allow the FBA to deliver its new Business Plan and become sustainable. It has, at times, been unsettling, difficult and demanding for everyone involved, but things are now starting to settle as we move through the transition period and I would like to thank all of the staff for their commitment and hard work during a difficult period.

After significant delays, we started the work on replacing our old oil boiler with a new biomass system in early December 2015 – not a good time to change heating systems! Thankfully we had a relatively mild winter and staff were only seen wearing gloves and hats inside the building on a couple of occasions.

Although we had a mild winter, we were affected twice by significant flooding. Firstly, in November the Windermere site was affected, although this was minor compared to the impact of Storm Desmond, which impacted the Windermere site significantly.. This tested the recently re-written Disaster Recovery Plan extremely well and has led to several changes in how we operate, as well as some minor changes to 'flood defences' and resilience. The staff worked tirelessly and in very difficult conditions to recover from the flooding and I must thank them again for all the hard work.

The pace of change has increased in the last six months and the building blocks for a more sustainable future are now in place. We have seen some other significant changes, including recruitment of new staff with expertise in areas such as business development, publishing, marketing and estates management. After many years of planning, we reached the final stages of identifying a building contractor and letting the contract for the re-development of the Annexe into holiday apartments and hope to commence work early in the new financial year.

Finally, before revieweing the activities of the year, I would like to thank our Chair, Geoff Bateman, and all the Trustees for all of their advice over my first year in office and in supporting the organisational review and changes that I have introduced.

Membership

The total number of members as at 31st March 2016 stood at 1146 (down 1.0% on the same period last year). A breakdown according to category is as follows:

Life Members	550	
Individual Members (full)	472	
Individual Members (student)	41	
Corporate Members	6	
Honorary Members (incl. reciprocal)	75	
Founder Members	2	
Total *(previous period)*	**1146**	***(1157)***

Widening an active FBA membership is a core strategic objective for the Association and growing the FBA's membership beyond its valued existing supporters is a priority action in the new Business Plan.

To help deliver this objective, we have developed an online membership service which allows people to join the FBA online via the website and also allows existing members to renew their membership via the membership portal. The addition of this new online system has seen a significant increase in new members joining and existing members renewing since it went live. We are currently looking into ways the membership system can be further integrated into the other online services we offer such as a 'Members only' area, plus developing the ability to allow people to set up direct debit payments for membership online.

Social Media

The FBA decided to increase its activity in this area to appeal to a current audience and take advantage of the ability to raise its profile as an organisation.

As at 31st March 2016:

Twitter Followers	1824
Facebook Likes	1055

Database and Web-development

Since the previous Annual Report, the FBA's Data and Information Services (DIS) have been working on improving the various digital services the Association provides.

We have been focusing on making various improvements to the data archive and, in particular, have added processing for the taxonomic cataloguing of images such that we can now link our list of taxa to the particular image in which they appear. This has been useful for ongoing work with the digital work being done with the Fritsch Collection, and also with the collection of electron microscope images; these images contain a great deal of detailed information on a variety of freshwater taxa, all of which we hope to be able to make freely available. We have also published datasets from Wensum and Avon in the data archive from Defra research platforms.

Technical improvements have also been made to the way data is published as a result of our work with Syngenta, publishing their Pond Mesocosm Data. Part of the project involved certification from the Open Data Institute. We achieved this and the dataset has a Gold level Open Data Certificate. The means to achieve a similar level of certification is now in place for any other dataset in the data archive.

Finally, we have created the FBA's new online blog www.fba.org.uk/blog where staff and invited guests can post articles of interest to the freshwater community.

Digitisation Projects

We tested the problem solving part of the Defra Demonstration Test Catchment (DTC) Archive system. We have continued to develop the specialist controlled vocabulary to include, for example, ecological vocabulary to allow publication, DTC data from the Avon and Tamar catchments and specialist ecotoxicology terms for the Pond Mesocosm dataset.

Further training of new staff in developing controlled vocabulary in the digital archive, will allow expansion of the digital Archive.

FBA Library and Collections

Significant effort has been spent in the Library to keep records and information updated. A volunteer started in January 2016 and has helped catalogue many collections, books and reprints. The collections that have been catalogued and integrated into the Library include those from Dr Nigel Holmes, Dr John Lund and Dr Gordon Reid.

Cataloguing is ongoing and includes collections from Dr David Solomon (Fisheries Consultant and Member of the Atlantic Salmon Trust's (AST) Scientific Advisory Panel) and Dr Jack Talling.

We have developed a Library tour and reading list as part of one of our training courses and hope to offer this as a regular part of future courses.

Two further donations of unpublished material were received from i) Dr John Lund's children, Professor Hilary Kennedy and Richard Lund, which included reprints, photographs, reports, letters, memorabilia and books and ii) Judith Lord, daughter of Philip Moon that included maps and reprints. A previous donation, together with this one have now been catalogued and included on the Archives Hub.

Three local academics have begun to research the FBA archives for a project on 'Women Freshwater Biologists 1945-1970' and are preparing a grant proposal. The researchers, Dr Wallace Heim (independent researcher), Dr Mark Toogood (University of Central Lancashire and Dr Claire Waterton (Lancaster University started in February 2016 and are initially concentrating on Winifred Frost's archives. to prepare a grant proposal.

The FBA Specimens and Sample Collections

The FBA's extensive specimen and sample collections are housed in two locations at FBA Windermere, the Hatchery and the basement of the Pearsall Building. In December 2015, following Storm Desmond and subsequent flooding, approximately 30 boxes of samples were damaged by water in the Hatchery. These have now been dried, re-boxed and stored elsewhere. Several boxes containing fish scales were also affected and were sent to a specialist restoration service.

Visits to curators at the Natural History Museum and conservator at the Linnean Society were undertaken following the flood to get further guidance on preservation and conservation of collections and specimens.

International Collaboration, Representation and Agreements

The Aquatic Sciences & Fisheries Abstracts (ASFA) Trust Fund Project was completed with 1150 Environment Agency (EA) reports added to the ASFA database. Further records of UK aquatic publications for input to the ASFA database were completed during the year.

The FBA were represented at the United Nations (UN) in May 2015 when they were invited to the UN Food and Agriculture (FAO) offices in Rome to discuss possible improvements to their aquatic information systems and explore a range of collaboration possibilities. We also attended the UN ASFA Advisory Board Meeting in Halifax, Canada in October 2015, chairing the meeting and presenting on Data Archiving.

Publishing

Books

A new key to British Leeches (SP69) has sold almost 200 copies since publication in August 2015. The *Guide to British Freshwater Macroinvertebrates for Biotic Assessment* (SP67) continues to sell well (173 copies since April 2015) while the revised The *Guide to Freshwater Invertebrates* (the 'Macan' book, SP68), sales are around 150 copies since April 2015. We would like to thank Alan Crowden for his role as Honorary Book Editor during the year.

Work is progressing on publications for 2016-2017, and is likely to include the much-anticipated Stonefly Key, a new Caddis key and potentially a revised Gastropods Key.

Journals

The FBA continues to publish *Inland Waters,* on behalf of The International Society of Limnology (SIL) with 42 articles being published during 2015-2016. We also continue our contract with SIL to produce their bi-annual members' newsletter *SIL News* with 3 issues produced since June 2015. We are planning to have a special volume of *Freshwater* Reviews in 2016 that will focus on the EU Water Framework Directive (WFD). Thanks are due once again to the Editor, Colin Reynolds, for his continued dedication. *Freshwater Reviews* continues to benefit from its continued collaboration with BioOne.

Newsletters

FBA News remains popular and we would like to extend our thanks to our contributors for sharing their knowledge with our readership and we would like to thank Dr Jonathan Grey in his role as Honorary Editor of *FBA News.* Electronic copy of the newsletter is now the main mode of delivery and this continues to save print and postage costs. Circulation of our popular monthly e-newsletter *Freshwater Matters* continues, providing a compilation of freshwater news and opportunities from around the world, as well as updates on what is happening at the FBA and ways to get involved.

Training

Training courses continue to be popular. During the year there has been a steady demand for programmed and bespoke courses, as well as continuation of accreditation, and general freshwater biology teaching. Our course programme expanded this year with a new Phytoplankton course and we will be looking to add further courses soon.

Programmed Courses

A full schedule of programmed FBA courses was run in 2015-2016 and included:

Entomology for Anglers

- Entomology for anglers Level 1
- Entomology for anglers Level 2
- Entomology for anglers Level 3

Introductory Invertebrates Courses
- Sampling and Identifying freshwater invertebrates

Advanced Species Identification
- Identifying caddis flies
- Identifying aquatic beetles
- Identifying chironomid larvae
- The Chironomid Pupal Exuvial Technique (CPET)

Advanced Bioassessment
- Invertebrate identification for biotic assessment (including examination)
- River InVertebrate Prediction And Classification System (RIVPACS)/River Invertebrate Classification Tool (RICT) bioassessment training

Freshwater Algae
- Introduction to phytoplankton
- Identifying macroalgae

Freshwater Fish
- Freshwater fish: assessment of condition and ageing
- Fish health, parasites and disease

Bespoke Courses

Several bespoke courses were also undertaken including:

- A Simuliidae training course for the EA in Exeter
- A two-day Anglers Entomology and Freshwater Invertebrate Monitoring course for the Loughs Agency/Scottish Centre for Ecology and the Natural Environment (SCENE), held at the Loughs Agency in Derry.

Teaching

FBA science staff have contributed to University level teaching for a number of University Departments. The FBA also hosts and contributes to a variety of University visits and courses and it has been in discussion with the University of Cumbria to explore opportunities with their BSc and MSc Aquatic conservation courses.

FBA University teaching, courses and field visits undertaken during the year include:

- Bournemouth University, undergraduate field courses (River Laboratory)
- Bristol University MSc teaching/field trip (River Laboratory)
- Exeter University, undergraduate field course (River Laboratory)
- Lancaster University Lake Ecology Masters field course (Windermere)
- Manchester Metropolitan University Undergraduate Invertebrate identification course (Windermere)
- Manchester Metropolitan University Environmental and Geographical Sciences (EGS) *MSc Field Trip* (Windermere)
- Southampton University, undergraduate bioassessment course (River Laboratory)
- Queen Mary University of London (QMUL), various field courses and visits (River Laboratory)

The River Laboratory again welcomed a visit from Oxford University students and tutors as part of their initial MSc course field trip including a presentation on the work of the FBA, a tour of the Laboratory and a walk around the experimental facilities.

Many of these institutions were 'returning customers' and we are encouraged by the steady growth in the number of University departments making a visit to our sites as a regular component of their courses.

The FBA hosted a number of keen and talented individuals through student and work experience placements. We link our placements to the achievement of important FBA goals and to help us deliver particular projects. For example, Katie Powell (recently graduated) and Scott Macdonald (Thomas Hardye School) worked at the River Laboratory to help with macroinvertebrate identifications and reference specimen collection; Florence Peynman-Jones (Baccalaureate Student Windermere School) helped the Pearl Mussel team to assess juvenile size variation within cohorts; Ted Ashberry (Kendal College) completed a placement in the Pearl Mussel team learning hatchery management and data input. Thomas Morris from The Lakes School, Emily Milburn from Queen Elizabeth Grammar School, and Alicia Goodfellow and Shaun Tipping from Kirkbie Kendal School also joined the FBA for work experience at Windermere.

School Visits

The River Laboratory has hosted a number of educational visits from local schools including Thomas Hardye School, Blandford School and Lord Wandsworth College. These educational visits are very popular with children and teachers and provide an excellent opportunity for young people to learn about freshwater biology and the importance of preserving our freshwaters.

Research and Scientific Contracts

Freshwater Pearl Mussel Projects

The Freshwater Pearl Mussel Ark Project has continued to produce good results this year. The project remains a collaborative one between the FBA, Natural England (NE) and the EA, and the number of juvenile cohorts at the Ark is increasing year-on-year.

Our 2014 bid to Biffa Award (a landfill tax fund supporting community and environmental projects across the UK) was successful. This 3-year, £1.5 million project focuses on pearl mussel habitat restoration in Devon, North Yorkshire, South and West Cumbria, and juvenile augmentation in one Cumbrian population. The project seeks to carry out river restoration in preparation for reintroduction of juvenile mussels reared in the FBA's Freshwater Pearl Mussel Ark. The project began in March 2015 and as the lead-partner, the FBA is co-ordinating the project from the Windermere site. Project partners include NE, EA, North York Moors National Park, South Cumbria Rivers Trust (SCRT), West Cumbria Rivers Trust (WCRT) and the Devon Wildlife Trust.

We now have a full-time Project Manager to lead the Pearl Mussel Team and manages both the Biffa Award and our Pearl Mussel Ark work. Four Project Officers were appointed with our project partners over the course of 2015. More information on the 'Restoring Freshwater Mussel Rivers in England' Biffa project can be found on the FBA website: www.fba.org.uk/restoring-freshwater-mussel-rivers-england. Substantial progress with both Pearl Mussel Ark management and Biffa Award project management has occurred since our Project Manager was appointed, including establishing delivery group meetings, developing our reporting and claims procedures, and leading on Biffa Award Project Board Meetings.

The heavy rainfall and flooding in December 2015 presented a unique challenge with much of the pearl mussel rearing operation being badly affected. FBA staff and Fellows coordinated a team response to the crisis and we are pleased to report that as a result of that effort few pearl mussel or host fish mortalities occurred. Lessons were learned about the resilience of the facilities on the shores of Windermere and we anticipate taking action to build better resistance to extreme flood events in the future.

A further challenge this year has been the proposed changes to landfill tax regulations and potential threat to the continuation of FBA's Biffa Award funding. We worked with other environmental bodies to contest the decision which has now been overturned. The immediate threat has eased but not disappeared. This has given us the opportunity to build a good working relationship with representatives at Biffa Award and seek further clarity from ENTRUST.

The year has also seen important scientific contributions on pearl mussels from the FBA with Roger Sweeting (FBA Honorary Research Fellow) leading on the establishment of a new CEN standard for pearl mussels, and the other members of the Pearl Mussel Team presented posters and a presentation at the *2nd International Seminar on Rearing of Unionid Mussels* in Luxembourg. In terms of wider public engagement, a Freshwater Pearl Mussel exhibit was also installed at the Windermere Lakes Aquarium.

Freshwater Biodiversity

We presented an initial proposal to the HLF for an FBA led project to reverse biodiversity loss for a number of freshwater invertebrates. Building on our expertise with pearl mussels, this project proposes to use captive rearing and reintroduction to former sites to safeguard some of our most critically endangered species. Some preliminary laboratory work on stonefly rearing to demonstrate the possibility of conducting complete life cycle rearing of Plecoptera (Stoneflies) in captivity has been undertaken.

Freshwater Macroinvertebrate Biomonitoring

FBA work on the the ongoing development of RICT continued this year. RICT is the standard tool used to set targets for macroinvertebrate quality for Water Framework Directive assessments of streams and rivers, and as such, RICT is widely used by the EA, Scottish Environment Protection Agency (SEPA), Natural Resources Wales (NRW), and the Northern Ireland EA.

RICT contains RIVPACS models developed for the FBA by Ralph Clarke. There have been concerns regarding some of the software coding and the FBA were contracted by the EA to develop independently coded versions of the models outside RICT, and to then test for any variance between the RICT and independent models. Phase 1 has now been reported on and second phase project is planned to test further components of the RICT system. The FBA collaborated with QMUL, to integrate the biotic indices LIFE (Lotic Index for Flow Evaluation) and PSI (Proportion of Sediment-sensitive Invertebrates) into RICT. Under contract to the Scottish Executive the team tested the performance of these biotic indices against stressor gradients and developed algorithms to enable their integration into the RICT river quality classification system. The project was reported in November 2015.

A RIVPACS/RICT test dataset developed as part of Phase 1 of the above project, together with all of the recent RIVPACS research and development work and associated contract reports, are now on the FBA website: www.fba.org.uk/river-invertebrate-classification-tool-rict-and-rivpacs.

Scientific Consultancy Services

The FBA completed its final report to SCRT to deliver pre- and post-project monitoring of river restoration projects on the River Kent system. These restorations form part of a Cumbria-wide river restoration strategy and the FBA played a key role in testing the hydrological and ecological outcomes of these river restoration schemes. The FBA also assessed the outcome of this work on resident populations of native crayfish.

The FBA continued its consultancy work for the Westcountry Rivers Trust in support of their Upstream Thinking project. Fifty-one species level macroinvertebrate samples were processed by FBA staff to help inform targeting of work to improve the quality of headwater streams. A total of 185 samples have now been processed for the Trust. The FBA also calculated and supplied results for a wide range of biotic indices derived from the samples. We have formed a link with Bournemouth University/Bournemouth University Global Environmental Solutions and have undertaken sampling in the New Forest to assess the ecological outcomes of Forestry Commission planned river restoration works on a number of small steams. Further repeat sampling and analysis is planned for spring/summer 2016.

Building on its renowned expertise in the area of freshwater macroinvertebrate laboratory sample analysis and identification, the FBA undertook external audits for Wessex Water on samples processed by their contractors.

The ongoing contract was also awarded by West Dorset District Council, funding the FBA to control the nuisance Blandford Fly (*Simulium posticatum*) in the River Stour. The Blandford Fly first came to notoriety in the 1960s and 1970s when numerous people reported bites in the Dorset town of Blandford. Bites from *Simulium posticatum* are a public health problem causing pain, itching and swelling that can sometimes require hospital treatment. The FBA continue to control of this species using a highly targeted bacterial pesticide *Bacillus thuringiensis* var. *Israelensis* which grows in the highly alkaline gut of the Blandford Fly larvae, whilst minimising affects on other non-target species.

Long-Term Monitoring

The River Laboratory Long-Term Monitoring (RLLTM) project seeks to understand the affects of climate change on stream invertebrate communities. Quarterly macroinvertebrate and diatom samples are collected from the Rivers Frome and Piddle in Dorset with assistance from students and volunteers. Linked to these samples, the FBA also collect water temperature and river flow data.

The FBA continued its long-term daily surface water temperature monitoring, lake level and rainfall of Lake Windermere. These data, with their very long run of continuous measurements – temperature records go back to 1931, grow in importance as we attempt to understand how climate change with affect our standing waters.

Studentships and Grants

The Association supported five PhD students during the year.

Helen Rosenkranz (University of Bristol), successfully defended her thesis in 2014. Journal papers associated with her research are currently in preparation, with one in the final stage of revision prior to publication.

Fiona Bracken (University of Durham) originally submitted a paper to *Molecular Ecology* at the end of 2013, on ‘Contrasting population genetic structure among freshwater-resident and anadromous lampreys: the role of demographic history, differential dispersal, and anthropogenic barriers to movement’. Her revised manuscript was resubmitted and subsequently published in 2015.

Clare Gray (QMUL) submitted her third year progress report in December 2015. She is currently writing up her research and hopes to submit her thesis in January 2016.

Louise Lavictoire (a member of FBA staff) continued her part-time studies on the freshwater pearl mussel with the University of Cumbria.

Gilson Le Cren Memorial Award

In 2015 the Gilson Le Cren Memorial Award was awarded to Mark Stevenson, a PhD student at the University of Nottingham, for his proposal entitled 'Variability in Arctic lake carbon processing during the Holocene along a landscape gradient: lipid biomarker records from Disko Island, West Greenland'. The funding will be used for the analysis of lipid biomarkers on sediment cores and catchment samples from Disko Island, West Greenland to complement an ongoing PhD project investigating the role of Arctic lakes in carbon processing, across a landscape gradient.

The FBA Grants & Awards Committee met in January 2016 and agreed that no Award for 2016 be offered and that it would be re-advertised again later in 2016. This recommendation was then formally endorsed by FBA Council.

The FBA contributed to an initiative of the European Federation of Freshwater Sciences (EFFS) to fund a collaborative European Freshwater Science Project for Young Researchers. The primary aim was to encourage young freshwater researchers across Europe to create synergistic interactions that lead to new knowledge, promote networking among young European Limnologists and offer experience in generating research ideas, acquiring funding, planning and carrying out a collaborative international scientific project. The first call was very successful with 5 proposals of a very high standard and the successful project was submitted by Katrin Attermeyer and Pascal Bodmer and entitled 'Assessing CO_2 Fluxes from European Running Waters – EuroRun'.

Profile enhancement and attendance at Conferences, Workshops and Events

Being a founder member of the EFFS we continued our close involvement by attending and manning a stall at the 9th Symposium for European Freshwater Sciences (SEFS 9) in Geneva. It was a very successful meeting with lots of interest in the FBA from an international audience. Two presentations and a poster were given on Pearl Mussel work undertaken by FBA staff.

In September 2015 the FBA ran a workshop on freshwater biodiversity loss at the Aquatic Biodiversity and Ecosystems Conference at the University of Liverpool.

The FBA attended a meeting with EA staff in Birmingham to inform the choice of invertebrate biotic indices for the River Invertebrate Classification Tool.

A presentation entitled 'The importance of cost-effective monitoring in river restoration' was given to the Society for Ecological Restoration meeting in Manchester in August 2015.

In October 2015 we attended an '*ACCE*' Natural Environment Research Centre (NERC) Doctoral Training Programme event in Liverpool.

The FBA gave a presentation 'Scums and Satellites' to the '*Cumbrian Lakes Research Forum* in October 2015.

Allan Pentecost, one of our Honorary Research Fellows, gave a presentation on freshwater algae to a conference of the *North Wales Local Records Centre* in Llandudno.

We attended a meeting on sediment pressure and the biotic index EPSI with the EA and SEPA in Peterborough in November.

In February 2016, we also contributed to a one day meeting with Natural Resources Wales who are developing a new biological data archive.

During February 2016 FBA staff also hosted a meeting with the National Trust in Dorset to explore ways in which our two organisations could work more closely together, with interest focussing on potential FBA involvement in freshwater monitoring at the Studland National Nature Reserve.

In the last quarter of the year the FBA contributed to other events including a 'From Source to Sink' workshop hosted by FBA President, Sir John Beddington, at the Cabot at the University of Bristol, and a Citizen Science Conference at Bournemouth University.

Between February and April many staff were involved in the planning and preparation for the FBA Annual Scientific Meeting and Open Day (scheduled to take place on the 11 and 12 May 2016 respectively).

Society Links

At a national level, the FBA has continued to have strong links, partnership or involvement with other organisations and societies, including co-secretary of the Aquatic Ecology Group of the British Ecological Society and as a Board Member and Steering Group Member for the Riverfly Partnership, a Trustee of the National Biodiversity Network (NBN), and a Steering Group Member for the Keeping Rivers Cool project.

Links between the FBA and Riverfly Partnership have been strengthened during the year. The FBA hosts the Riverfly Partnership database and assists the Partnership with training, and is closely involved in several local HUBS. The FBA is now developing a potential new Extended Riverfly Scheme to complement the existing system in collaboration with the Riverfly Partnership and Dorset Wildlife Trust.

Site Development

Annexe

At Windermere, development of the Annexe Building into apartments is progressing. The winter floods of December 2015 necessitated a review of the original design brief for the Annex to achieve a greater degree of flood future proofing. During January and February 2016 we selected and appointed our chosen contractor (Pinington Ltd) who we anticipate will start the refurbishment work by May 2016.

Green Energy

A new Biomass (wood pellet) boiler system supplying heat and hot water was installed in the basement of the Pearsall building at Windermere. District heating pipes were also installed ready to also supply heat and hot water to the Annexe apartments. It was decided not to proceed with the installation of Photovoltaic's to supply electricity to the Pearsall Building.

Personnel

We would like to send our congratulations to Terry Gledhill and Malcolm Elliott, both Honorary Research Fellows, who have recently celebrated 60 years and 50 years respectively with the FBA**.**

We were sorry to say goodbye to Judith Lomax, our Finance Manager, who left us in September 2015. During her time with us, Judith had significantly improved our understanding and reporting of the FBA finances. The work that Judith led was fundamental to the development of our new Business Plan and delivery model. We were also sorry to say goodbye to Tamsin Vicary, our Collections Manager, who was only with us for a year, but delivered a number of successful library and information projects. Finally, Jonny Freeman, our Facilities Assistant, left us in January 2016.

We were very pleased to welcome several new members of staff during the year who are all based at Windermere. Ceri Gibson joined us in June as the Pearl Mussel Project Manager, overseeing the Ark Project and the Biffa Award Project. In July, Alison Holland joined as a part-time Administrative Assistant. During September Bill Coupe joined us as our new Head of Business, Tim Ashberry as our Estates Manager and Gill Stables replaced Judith Lomax as our new Finance Manager. In October Louise Ennis joined us as our new Marketing Manager and Michelle Jordan joined us as our new Publications Officer. Finally Isabelle Charmantier began in early November as our Information Scientist, replacing Tamsin Vicary.

FBA Fellows and Volunteers

We would also like to acknowledge and thank our FBA Honorary Research and Information Fellows for their ongoing help and support, without which much of our work would not have been possible:

Professor Patrick Armitage	Dr Allan Pentecost
Professor Malcolm Elliott	Ian Pettman
Dr Glen George	Dr Paul Raven
Terence Gledhill	Professor Colin Reynolds
Dr Elizabeth Haworth	Dr Roger Sweeting
Professor Alan Hildrew	Dr Ian Wallace
Dr Mike Ladle	

We would also like to thank the volunteers that have given so freely of their time to help the Association, in particular Brenda Leese, Anna Callaghan who have helped tremendously with the cataloguing and photography of the Fritsch Collection and Kathryn Champness who has been assisting Isabelle Charmantier with cataloguing in the Library.

Council

We would like to extend a big thank you to Peter Andrewes, our Honorary Treasurer for the last eight years, who retired at the AGM in September 2015. The Association is indebted to Peter for his hard work and commitment during his time in office. Ron Middleton joined us at our new Honorary Treasurer and he took over his new role during the AGM. Ron is a chartered Accountant and is retiring from his post of CEO of a hospice in the Midlands in early 2016. We are looking forward to working with him more closely.

Reports from Honorary Research Fellows

FBA Honorary Research fellowships are awarded to distinguished scientists who wish to continue their research after retiring from employment. The FBA provides desk space and laboratory facilities and in return gains scientific recognition through published papers as well as promotion of the Association through presentations and support.

Below are short reports from the HRFs outlining key science-related activities during the year. Note that many of the Fellows are also involved in other activities, including training courses, provision of advice and management of facilities, and they are mentioned in these contexts elsewhere in this report.

Patrick Armitage
Invertebrate Ecology
I continue to collaborate with University of Loughborough and Bournemouth University and maintain daily contact with my colleagues in the River Communities Group (formerly CEH but now School of Biological and Chemical Sciences, QMUL) in an advisory and collaborative role.

Both papers on the South Winterbourne are now published but in view of the unusual weather patterns, monitoring is continuing at a low level. Following publication of a paper on the Sherford River further surveys of streams entering Poole Harbour have begun. The data will contribute to the Poole Harbour Catchment Initiative whose aim is to develop catchment management plans which meet the needs of both European and UK legislation as well as the needs of local people, businesses and wildlife. To-date 8 streams have been examined including one at the site of an old clay mining works with a pH of 3.0. Samples are currently being processed for analysis and subsequent publication.

Between 1999 and 2014 I have observed the fauna of small winter flooded pools in the Frome floodplain adjacent to the River Laboratory. These data form the basis for an article in *FBA News*. The ephemeral conditions (cold, drying out) do not favour the development of a rich fauna for individual pools (8-20 taxa in November to January and 16-34 in March) but overall, 153 taxa were recorded. A recent study (Armitage *et al* 2012) of tyre tracks and puddles has shown that these unprepossessing habitats can together support high biodiversity (174 taxa) and the flooded pools examined here have shown a similarly high value. Management regimes which aim to reduce topographic variability (levelling land and infilling depressions) will reduce the mosaic of small temporary habitats which facilitate the spread and survival of freshwater taxa and maintain the diversity of the floodplain.

I continue assisting staff from Queen Mary College who are now handling the yearly survey of the Bovington Stream which drains the MOD tank training range. In addition I have written a commissioned report for Bournemouth Water on the potential risks of midge swarms from a newly constructed reed bed and have provided information to Dorset County Council on the same subject.

I continue to collect and record Chironomidae locally. The description of *Chaetocladius purbeckensis* sp nov is now published together with that of another new species *Metriocnemus albipunctatus* which I found swarming over reeds in an intermittently wet floodplain pond adjacent to the River Frome downstream of the River Laboratory.

J. Malcolm Elliott
Ecology of freshwater fish and zoobenthos
Although there is a huge amount of information in this field, there is still a need for detailed quantitative studies, especially those leading to the development of predictive models. Most of my work is aimed at fulfilling this need. However, I have also retained an interest in the natural history of freshwater animals, including the publication of monographs in the FBA series of scientific publications.

I started work at the Windermere Laboratory of the FBA on the 1 September 1965, and celebrated 50 years of working at the same laboratory in September 2015. The good news in 2015 was the publication of the FBA Scientific Publication on the 'Freshwater Leeches of Britain and Ireland' (Elliott & Dobson, 2015). I am very pleased with the final product, especially the excellent illustrations by Mike, and wish to acknowledge the help provided by the editor, Alan Crowden.

As I will soon be celebrating my 76th birthday, I have ceased refereeing papers and am no longer on the editorial board of any journals. I have also published my last single author paper which is also the last to be published on the juvenile sea-trout population in Black Brows Beck (Elliott, 2015). It describes density-dependent and density-independent growth in the population, assessed using long-term data over 35 years (Elliott, 2015). Although growth in terms of overall mean length was density-independent, individual variation in trout growth was density-dependent, being highest at low density and lowest at high density of trout. Although I will no longer be producing single author publications, I hope to continue as a co-author on papers originating from theses produced by students who I co-supervised whilst I was a visiting professor at the University of Tromsø. If this work is not published, it will remain in a thesis that hardly anybody will read.

One such paper appeared in 2015 (Svenning, Hanssen & Elliott, 2015), and describes changes in the density and growth of brown trout (*Salmo trutta*) after intensive removal of sympatric Arctic charr (*Salvelinus alpinus*) in the sub-Arctic lake Møkkelandsvatn, Norway. This study tested the hypothesis that the removal of 31,000 charr from the lake in the period 1990-1992 would cause an increase in both the growth and density of the sympatric trout population. This hypothesis was only partially supported; the growth rate of trout increased, while the density of juvenile trout (age groups 1+, 2+), but not older trout (3+, 4+), increased after the removal of the charr. However, we do not know whether the ecological changes observed in the trout population are temporary or permanent. Only a long-term study over 20 years or longer would answer this question, and such studies are even rarer than those on the effects of a mass removal of a species.

D. Glen George
Limnology and zooplankton ecology
In 2015 my activities were:

1. Providing support for the EU NETLAKE project.
2. Providing support for the Lake Dynamics Monitoring Station (LDMS) deployed on Llyn Tegid (Snowdonia).

The NETLAKE project is designed to demonstrate how automatic monitoring systems, of the kind pioneered at the Windermere laboratory in the 1990's, can be used to support the management of lakes. The project is now in its penultimate year but plans are being made to develop some complementary activities that will continue beyond 2016. In 2014, I provided the project with some examples of the different ways in which these systems have been used to support long-term studies in the English Lakes District. A paper entitled 'Automatic High-frequency Monitoring for Improved Lake and Reservoir Management' is currently being prepared and will be finalised at a meeting held in Riga, Latvia.

The monitoring station deployed on Llyn Tegid in 2006 has now been replaced with a more sophisticated unit that includes a winch for automatic profiling. Funding for the upgrade was provided by the UKLEON project co-ordinated by CEH but more work is required on the software used to drive the winch.

Terry Gledhill
Invertebrate Taxonomy
The first volume of the key to the water mites of central and north-western Europe is with the publishers, final proofs have been examined and we (7 April) await publication. This collaboration with my continental colleagues has been a great pleasure, an unforgettable experience and it has worked! Once again I thank Council for support during the project.

This volume deals with 2 superfamilies, 21 families, 58 genera and 356 accepted species. The keys to genera cover the whole of Europe, those to species to the area covered. A copy of this volume, Gerecke *et al* (in press) will join the other two, Davids *et al* (2007) and Di Sabatino *et al* (2010) in the FBA Library.

I have made further progress on a revised checklist of the British and Irish water mites, ca 270 species.

I have continued to identify, or verify identifications, of material for colleagues and from extra FBA sources.

With help and encouragement from my wife, a goodly amount of lab 'clutter' accumulated over the last 60 years has been disposed of, but I feel this will be an ongoing project.

References (other than in list of Publications below):
Davids, C., Di Sabatino, A., Gerecke, R., **Gledhill, T.**, Smit, H. and Van der Hammen, H. (2007). Acari: Hydrachnidia in: Gerecke, R. (ed). Chelicerata: Araneae, Acari I: Süsswasserfauna von Mitteleuropa 7/2-1: 241-376. Elsevier Spektrum Akademischer Verlag. Műnchen.

Di Sabatino, A., Gerecke, R., **Gledhill, T.** & Smit, H. (2010). Hydrachnidia, Hydryphantoidea and Lebertioidea. In: Gerecke, R., (ed). Chelicerata: Acari II; Süsswasserfauna von Mitteleuropa 7/2-2: 1-234. Spektrum Akademischer Verlag. Heidelberg.

Elizabeth Haworth
Fritsch Collection
My thanks go to my two volunteers, Brenda Leese and Anna Callaghan, for their help as it allows us to continue adding material to the Fritsch Collection from recent journals that we can either download, or get by exchanges and many new taxa from. c. 130 papers have been added. We would be grateful for any reprints of new algal taxa as we don't have access to journals unless they are open access. The link to European Biological and Horticultural Libraries (EBHL) is invaluable.

The data check of all the Characeae sheets completed and also the 2nd half of the Desmid sheets bringing that group total to c.12,000 sheets;.we continue to check the sheets of the Chrysophytes, correcting and repairing where needed before any photography.

Attending the Linnean workshop entitled 'Cabinet to Internet' showed that the amount of work getting archives online was amazing and indicated that a website could also bring more people to the real material. We are therefore delighted that Nick Bywell is moving the Fritsch Collection forward in this direction and discussion is clearly very important in making it useable. We have further increased the number of images stored, having completed 474 of the genus Chara to provide these for the trial run.

I again contributed to the Macroalgal Course at our laboratory in May 2015. The 6th European Phycological Congress in London in August was very stimulating with splendid plenary and public lectures and many other talks. We added our poster about the work of the Collection to a large array of others.

I have responded to various algal queries either coming direct, or through ALGAE_L and have provided images where needed. I have been researching the records of a desmid species, *Euastrum spinulosum* Delponte, in collaboration with an Egyptian post-graduate at Ain Shams University, Cairo, Egypt to determine whether we have a new species or variety. There are 23 sheets of illustrations spanning the years 1880 to 2000 in our Collection and

these include c.32 taxa (varieties or forma) with many useful notes by Professor Fritsch providing data on the shapes and sizes for comparison.

In September I had the opportunity to visit the National Oceanography Centre at Southampton and to discuss the possible storage of some of the FBA's sediment cores but we still have to decide which need to be archived.

Book reviews – reviewing the c.1000 pages of the 2nd edition of the 'Freshwater Algae of North America' was an enjoyable chore, while reading the book 'Equatorial Equilibrium' edited by Dr Mary Burgis and Dr Ian Dunn about the Royal Society African Freshwater Project, in which FBA played such an eminent part, was a delight and is well recommended.

Alan Hildrew
Ecology of Streams and Rivers
I finally retired as Chief Editor of Freshwater Biology at the end of June, which has made a huge difference to the time I have had available for other things in the latter part of 2015. In work terms this has overwhelmingly been spent working on the book I have to write for the International Ecology Institute (for the prize awarded in 2012). Having promised to finish this before, and failed to do so, I am reluctant to give a completion date now, but I have at last really got down to it and recent progress has been fairly good. I also plan a book on stream ecology when the IEI book is finished, so my hands will continue to be full. Other writing projects are a paper on the apparent lack of effect of changes in temperature on the distribution of net-spinning caddis larvae in the Rivers Usk (south Wales) and Loire (France). This has been quite complex, particularly in gathering together temperature records, but the paper is now almost finished. Other papers on the brink of submission are: a) on how 'gallery' (tube) building larvae manipulate algae in their territories - effectively they are gardeners, and b) the production of methane oxidizing bacteria in UK rivers. Further down the line is further work on the incorporation of methane-derived carbon in the tissues of grazing caddis larvae.

I continued to play a part in the UK's Uplands Waters Monitoring Network, being responsible for the macroinvertebrate monitoring, which we completed in 2015. Despite the continued enthusiasm of the devolved Governments in Wales and Scotland, and from the Forestry Commission, Defra has cut their crucial central funding, so the prospects for continuing this important network (the only UK-wide monitoring of upland waters – begun in 1988) are now rather bleak.

I represent FBA on the European Federation for Freshwater Sciences (EFFS) and served on the scientific committee for the 2015 SEFS (Symposium for European Freshwater Sciences: a series of meetings founded by FBA) in Geneva this summer – at which I gave a paper. I was also a judge for the EFFS prize for the best European PhD thesis, the winner of which gave a keynote paper at the Geneva meeting. I also helped to judge the first project proposals for research programmes by early career European researchers (funded jointly by the group of European freshwater societies). I am pleased that Bill Brierley has now joined me on EFFS and that FBA is poised to continue its role in this important. The next meeting will be in The Czech Republic in 2017. I am also on the Scientific Committee of the upcoming SIL (International Association for Limnology) meeting in Turin (July/August) and will attend and give a paper.

As adjunct tasks, I remain on the Scientific Advisory Committee of Natural England (NESAC), whose main task is to scrutinise the evidence produced by NE. I have also been asked for advice on promotions and appointments at several UK and overseas Universities, and review papers for other journals (mainly *Global Change Biology* and *Ecosystems*). I continue to act as a REF advisor for a number of University departments.

Finally, my last PhD student (Aurora Sampson) was awarded her PhD in 2015, entitled 'The role of methane-derived carbon as an energy subsidy to benthic invertebrates in streams'.

Mike Ladle
Ecology of Fish
In 2015 Dr Stewart Welton and I were again contracted by North Dorset District Council, under the auspices of the FBA, to control the Blandford Fly. Although monitoring has been reduced in recent years, the treatment appears still to be very effective. The *Bt*I formulation - VectoBac 12AS - was applied at selected sites, on the basis of EA discharge data, to achieve a concentration of 0.8 ppm. for no more than 10 minutes. At a meeting of those bodies concerned with the treatment, which was held in November 2015 and attended by Dr Welton, it was suggested that they might introduce a longer term (c. 5 year) plan for treatment which would, of course, make it much easier for us to prepare for the annual introduction of *Bt*I. Until now the approach has involved a 'last minute rush' in March/April when the local authority confirms whether the treatment will go ahead or not.

I visit the River Laboratory periodically to liaise with members of the staff of FBA and other organisations.

My role as advisor to the River Allen Association continues, although the major problems with the River (abstraction, pollution, lack of weed growth) seem to have abated.

I continue to be responsible for the administration of the FBA fishing at West Holme, dealing with the fishermen, fees, fishing rota and reporting on the state of the fishery, its banks and bridges etc. The new FBA arrangement with the fishery tenants on the north bank at East Stoke worked well in 2015 and I would expect it to continue in 2016.

Replacement steps have been purchased to make essential repairs at the south end of the one usable bridge at West Holme. Due to administrative problems, the installation of the steps has been delayed and repairs cannot now take place until river levels fall and the land firms up to permit access for vehicles.

The run of salmon on the Frome in 2015 was much improved (FBA Counter figures) and catches on the FBA's West Holme fishery were excellent with 56 salmon and 58 seatrout landed (in 2014 only 16 Salmon and 52 seatrout) reported by anglers. All salmon and most seatrout were returned alive. For two years now the fishing conditions have been excellent. I believe that salmon catches also improved in other local chalk-fed rivers but the reason for the increase is not apparent.

Following this season's larger catches, the fishing at West Holme is likely to be fully booked in 2016. I suggest that if the improvement is sustained, it may be appropriate to increase the fees in 2017.

I continue to do a number of public lectures to local groups on topics relating to aquatic biology including fish research and the Blandford Fly. Many of these promote the work of the FBA. Four more books are currently in an advanced state of preparation.

Allan Pentecost
Limnology and Algology
Another busy year, with plenty of work going on. The Robson Meeting at Reading on Invasive Plants and Animals was attended on behalf of the FBA in March and a report prepared for the FBA. A wide range of disciplines was represented and up-to-date reports provided on some of the more aggressive invaders was provided (e.g. zebra mussel, red-clawed crayfish and Himalayan balsam). Later in the month a course on phytoplankton was given with Bill Brierley at the River Laboratory in Dorset. It was undertaken for EA staff and was well received. A further course on phytoplankton was given at the FBA Windermere Laboratory in September and the macroalgae course was also given with Martyn Kelly in May. Both appeared to be well received. A lecture was also given at the Llandudno Cofnod seminar on the freshwater algae and general limnology of the Snowdon massif in October. Algal samples were collected for the Sandscale 'Bioblitz' in June and a report prepared for the warden. A number of enquiries concerning algae and bacteria were also dealt with, two of which involved voluntary field work

A survey of UK sulphur springs has continued with three more sites visited, microbial samples taken and waters analysed. A good many more springs have yet to be visited when time and weather allows. A manuscript on the shapes of algal cells is almost complete and will be submitted to an algal journal early in the new year. The freshwater algae of Cumbria is also well advanced. A few additional species need to be added to the non-diatom list and Elizabeth Haworth has been busy updating the diatom list. Once published, this work will be the first comprehensive account of the freshwater algae of the Lake District and is long overdue.

Work on the Phosphorus book/article has continued with the addition of notes from further papers and rearrangement of the text. Further work has also been undertaken on the littoral algal floras of the Lake District standing waters, that have been much neglected. Interesting relationships between several species of cyanobacteria and lake water chemistry are becoming apparent. A paper on subaerial algae will soon be submitted for publication.

An article on the dangers of slippery algae, with much of the work undertaken in the Lakes has been published.

Ian Pettman
Data and Information Retrieval
This reporting year divided into three distinct periods of work.

February 2015 to end of June 2015
During this period I continued to work with Ms Vicary, mainly in gaining and completing relevant contracts but also with the collections.

DTC Contract and AEDA:
Ms Vicary and I completed testing of the data publication system and continued to work on the vocabulary in order to get the first data sets archived.

Atlantic Salmon Trust Contract:
Outstanding work was completed and discussions for the possible future of this work were undertaken.

Aquatic Sciences and Fisheries Abstracts (UNFAO):
Negotiations for the FBA to become the official UK National Centre for this service were completed and the agreement was signed on 10 March 2015.
The ASFA Trust Fund Contract was completed on time by mid June 2015 and all payments were received.

Visit to UN FAO Rome:
Ms Vicary and I were invited to the Rome office of FAO for the week 11 to 15 May 2015. We had a meeting packed week and returned with a wide range of potential collaboration and joint contract work areas which were detailed in our Back to Office report.

Collections:
I assisted Ms Vicary with the drying and conservation work following the CEH flood of the Pearsall Building in early February.
Also in early February Susan Jones and I collected the Nigel Holmes archive and, with Ms Vicary, we outline sorted it for further work at some later date.

Summary:
Ms Vicary left the FBA at the end of June having completed all contracts on time during her 13 months with the organisation.

July 2015 to mid October 2015
During this period I spent approximately 1 day per week on enquiries, vocabulary work, dataset publishing and the flood damaged specimens.

Representing FBA:
I represented the FBA in its new role of National Centre and also acted as the Chair of the UN FAO ASFA Board Meeting, Halifax, Nova Scotia for the 5 days of 5–9 October 2015. A range of collaboration and contract possibilities were detailed in my Back to office Report.

Mid October 2015 to end of February 2016
During this period I have mainly concentrated on my research fellowship work. This involves work on revising several information retrieval tools (the ASFA Subject Thesaurus and the 24,000 geographic authority strings); defining metadata fields for the incorporation of dataset records in Abstracting and Indexing services; impact analysis of such services; facets in aquatic vocabularies etc.

I have, however, also provided the FBA's 2015 input of 450 records to the ASFA database.

Training and support to the new Information Scientist post holder Dr Isabelle Charmantier has also been given.

Paul Raven
River Ecology and Morphology
River Habitat Survey continues to be an important part of my research fellowship themes of fluvial morphology and river ecology. In July, Peter Scarlett (CEH) and I provided tuition for the annual River Habitat Survey training course run by the University of Poznan. This annual event for Polish ecologists, engineers and water managers enables me to promote the work of the FBA. More than 10 years of collaboration, initiated by Dr Hugh Dawson (CEH), has produced several PhD theses, research reports and published papers. There are now over 1,000 survey sites on the Poland RHS database, which enables river character in the UK and Poland to be compared, thereby demonstrating a practical application of the method on a European scale.

The RHS method and analysis of survey data collected across several European countries were used to help develop two European (CEN) standards for assessing river hydromorphology. These standards, endorsed in 2004 and 2010, form the basis for assessment methods for the EU Water Framework Directive. I attended a review of these standards at a CEN working Group in Edinburgh on 23-24 February, where discussion focused on where and how the technical guidance could be improved.

Two months beforehand and also in Edinburgh, I was privileged to collect The British Ecological Society (BES) Marsh Award for best ecology book 2015, awarded to '*Rivers: a natural and not-so-natural history*' written by Nigel Holmes and me. Nigel's widow, Linda, accompanied me at the ceremony which was part of the BES Annual Meeting. My position as an FBA Honorary Research Fellow featured prominently in the BES publicity material.

The Annual Meeting in Edinburgh was my final one as BES Council Member. I represented the FBA during my four years tenure and managed to raise the profile of freshwater matters generally, most notably by promoting 'The Impact of Extreme Events on Freshwater Ecosystems', first as a topic and then as a publication (June 2013) in the Ecological Issues series. As a longstanding (30+ years) member of both BES and FBA I intend to continue advocating closer working links between the two organisations. There is so much to be gained from the wider perspective, international experience and specialist expertise of recently and not-so-recently retired professionals in commenting on major policy matters and technical issues. Probably even more important, providing this wider perspective would be invaluable advice in helping ecologists at the start of their careers.

Colin S. Reynolds
Ecology of Phytoplankton
My work this year that can be referred to the FBA has included some science writing, attendance at one meeting and continued efforts to edit the FBA's journal, *Freshwater Reviews*. However, I can offer little tangible evidence in support of this effort. I gave a paper at the 2014 AGM at the University of Manchester, a meeting that was held concurrently with the autumn meeting of the Midlands and North-West Freshwater Group, on 27 October 2014. My presentation was of previously published work on the hydrological control of water quality in Grasmere, in the English Lake District. It seemed to be of interest to current members of the Group, at the same time as being very 'FBA' in its content, covering an analysis of the long-term (40-year) data on this lake.

What began as a response to an invitation to contribute a chapter to a new book about Rostherne Mere National Nature Reserve, near Knutsford in Cheshire, I have been happily engaged in refreshing my knowledge of the region (I started my PhD work on the Cheshire-Shropshire Meres in 1966). Thus, this new review is something of a golden anniversary for me – I was quite aware of the further researches that have been continued at the Universities of Liverpool and Manchester but they now contribute to a much broader knowledge of the origin, hydrology, chemistry and ecology of the meres that is rather more detailed and comprehensive than in my day! Drafts of two chapters have been assembled, pending their integration into the whole work, hopefully, later this year.

Work on '*Freshwater Reviews*' has not resulted in any publication during 2015. The problem has been a dearth of good submissions. (We had some submissions that we have had to reject, on the grounds of quality or of being ill-disguised research papers). In truth, we need more contributors – it is difficult for many researchers to fulfil our requirements whilst continuing to satisfy modern pressures to maintain research output. I am hoping for a less restricted response to our stated intention to publish a themed edition, over-viewing the successes of the Water Framework Directive.

I am grateful to the current staff of the FBA and to erstwhile colleagues for support and assistance with my requests for information.

Roger Sweeting
Water Quality and Fish Biology
In February 2015 the Biffa-Award project officially started and 2015-2016 has been heavily influenced as a result of this award. The appointment of Dr Ceri Gibson as Project Manager (Pearl Mussel) was made in February but she was unable to take up her appointment until June. David Beuzeval was drafted in to assist with the administration, but the first few months of this project were frantic. Subsequently the project has become more organised. The Christmas floods caused severe disruption when the Gas House containing the juvenile mussels was flooded to several feet and the pumps supplying water to the Hatchery were overwhelmed and rendered inoperable. The flood was more protracted and had greater consequence than that of 2009 for the Pearl Mussel Project. Fortunately a recently refurbished oxygenation system and a temporary system of pumping meant that the project lost only 50 fish out of 2000+ carrying larval pearl mussels and no discernible loss of juveniles (the oldest of which are now approaching 9 years) or of adult mussels (overall there were relatively few mortalities of mussels and host fish over the year). It has resulted in a re-examination of FBA's flood resilience. The project continues to occupy most of my time.

During the year Louise Lavictoire, who is working on a part-time PhD on pearl mussels at FBA, published a joint paper in Hydrobiologia.

Together with Soraya Alvarez and Dr Anne Powell, I attended the SEFS meeting in Geneva representing FBA and presented a paper on some of our work on pearl mussels. Soraya presented a paper on part of our study of the historical changes in the River Ehen and Anne provided support for the FBA's stand and promoted FBA's activities. A poster on the pearl mussels by Eloy Benito-Reyes, who manages the hatchery, was also displayed at the meeting.

A paper and two posters were also presented at the 2nd International Seminar on the rearing of unionoid mussels in November 2015 at Clervaux, Luxembourg by Louise Lavictoire and Eloy Benito-Reyes on behalf of the Pearl Mussel Team.

Examinations of fish under Section 30 of the 1975 Salmon and Freshwater Fisheries Act prior to movement between inland waters continue-these provide a small, regular income to FBA.

Over the next year there will be a similar range of activities involving myself and the Pearl Mussel Team. We will be producing further scientific papers and seeking funds for pearl mussel related projects as well as trying to improve the juvenile survival rates.

I also chair the SCRT, one of the partners in the Biffa Award project-SCRT is also a partner with FBA in the reed restoration project at Mitchell Wyke.

In 2015 the working group that I Chair in CEN (Comité Europeén de Normalisation) had its proposals for 20 European standards accepted for inclusion in an amending directive to the Water Framework Directive. This is the culmination of more than 12 years of work between the participating countries and brings a more scientific approach into the legislation that assesses our fresh (and coastal) waters. Associated with this and as chair of the responsible BSi Committee (EH3) I was awarded a Distinguished Service Certificate in February 2016.

References (other than in list of Publications below):

Alvarez-Codesal. S & Sweeting, R.A.: Historic changes in the Upper River Ehen Catchment. A report for United Utilities. FBA Publication. May 2015.

SEFS 2015 Benito-Reyes, E. & Alvarez-Codesal, S.: Variability within pearl mussel populations and their life cycle (in captivity) – poster

SEFS 2015 Sweeting, R.A., Benito-Reyes, E. & Lavictoire, L.: Captive breeding of the freshwater pearl mussel, *Margaritifera margaritifera,* and its importance in enhancing conservation and biodiversity practices–presentation.

SEFS 2015 Alvarez-Codesal. S & Sweeting, R.A.: The importance of the historical background of a river catchment and the ecological implications for restoration and management-presentation.

Luxembourg 2015 Lavictoire, L., Benito-Reyes, E., Gibson, C. and Sweeting, R.A.: Effects of substrate size and cleaning regime on growth and survival of growth and survival of captive -bred juvenile freshwater pearl mussels, *Margaritifera margaritifera* (Linnaeus 1758).

Luxembourg 2015 Lavictoire, L., Moorkens, E., Ramsey, A.D., Sinclair, W. & Sweeting, R.A.: Investigations into feeding structures of juvenile freshwater pearl mussels (*Margaritifera margaritifera)* through electron microscopy.

Luxembourg 2015 Benito-Reyes, E., Alvarez-Codesal, S. & Sweeting, R.A.: Variability within freshwater pearl mussels and their life cycle (in captivity).

Ian Wallace

Taxonomy and Distribution of Trichoptera

Specimen collection is still focussed on acquiring material to enable the production of a new key to Caseless Caddis. Trips to the Wyre Forest and the eastern Black Mountains were particularly successful for early instars of the Psychomyiidae. Focus for fieldwork is now on the three caseless species still not available to me as early instar larvae. Examination of material acquired so far confirms that existing characters, appropriately refined, will identify many instars 5 and 4; but new characters will be required for some instar 3 and most even smaller larvae.

The riverfly movement, and I attend meetings of the Riverfly Partnership steering group, has created a demand for intermediate level identification resources to enable monitors to develop their interest. I supported the production of identification materials by the Salisbury-based Centre for Riverfly Conservation and I have agreed to work with the Field Studies Council (FSC) TOMBIO team on multi-access keys. Short videos of live caddis and other invertebrates are one element I am pursuing. Though based at FSC, there is no requirement that TOMBIO products are produced by that organisation and they could theoretically feature in the suite of 'publications' from FBA.

The UK Caddis Recording Scheme data base now stands at 370,000 entries. A personal backlog of material for identification was eliminated this year. This year the 2015 data set will be made available to NBN. A review of the conservation status of all UK caddis is, will be published very soon by NE. This will underpin conservation efforts for species and sites and strategies for the monitoring of the rare species were the subject of a recent conference at the Biological Records Centre which I attended. The NBN Gateway, soon becoming Atlases of Living Scotland, England and Wales should be the most up-to-date medium for distribution maps. I have attended meetings with NBN staff and attended their annual conference. I am exploring, with various bodies, making the NBN maps easier to up-date, and to enrich the underlying data set. Better maps will enable me to incorporate them into an improved UK Caddis web site and I am writing species accounts to accompany them.

There are many avenues for naturalists to submit records for use by others but iRECORD and iSPOT are two national systems and I verify caddis records for both. Many are of live adult caddis and I am exploring ways of finding new identification features as it is impractical to ask for photos that require the specimen to be killed.

Introducing people to freshwater life remains a passion and I am looking forward to working with FBA staff in developing the public profile of the labs and their work via media such as festivals, Bioblitzes and displays. It is very gratifying that several students on my annual caddis course at Windermere, which ran again this year, have come to caddis recording via the angler monitoring initiative, where only very simple caddis larva identification is required.

Publications by FBA Staff and Honorary Research Fellows

Pretty J, et al (2016). *Macroinvertebrate surveys of the Bovington Stream and River Frome*. Report Commissioned by Debut Services (South West) Ltd on behalf of the Ministry of Defence.

Armitage, P.D., Bass, J.A.B. & Hawczak, A. (2015). The environmental quality of the Sherford River (Dorset) assessed with macroinvertebrate data. *Proceedings of the Dorset Natural History and Archaeological Society* 136:18-29.

Langton, P.H. & **Armitage, P.D.** (2015). *Metriocnemus albipunctatus* sp. nov. (Diptera, Chironomidae) from England. Dipterists Digest 22: 5-10.

Langton, P.H. & **Armitage, P.D.** (2015). *Chaetocladius purbeckensis* sp. nov.: '*Chaetocladius* sp. Dorset' (Diptera, Chironomidae) Langton and Armitage (2010) named. *Dipterists Digest* 22:13-15.

Armitage, P.D. (2015). *Constructed reed beds as potential sources of nuisance swarms of insects.* A Report to Bournemouth Water. pp 10.

Elliott, J.M. (2015). Density-dependent and density-independent growth in a population of juvenile sea-trout, *Salmo trutta*, assessed using long-term data from a small stream in Northwest England. *Freshwater Biology*, **60**, 336-346.

Elliott, J.M. & Dobson, M. (2015). Freshwater Leeches of Britain and Ireland: Keys to the Hirudinea and a Review of their Ecology. *Freshwater Biological Association, Scientific Publication* No. **69**. pp. 108.

Svenning, M.A., Hanssen, O.K. & **Elliott, J.M.** (2015). Changes in the density and growth of brown trout (*Salmo trutta*) after intensive removal of sympatric Arctic charr (*Salvelinus alpinus*) in the sub-Arctic lake Møkkelandsvatn, Norway. *Ecology of Freshwater Fish*, **24**, 591-599.

Haworth, E.Y. (2015). 'What John Lund did for me' a tribute. The Phycologist 89, 22-23. Haworth, E.Y., Leese, B. & Callaghan, A. 2015. The Fritsch Collection of Freshwater, Brackish:and Terrestrial Algae Illustrations: Cataloguing changes in algal taxonomy over time. Abstract in 6th European Phycological Congress handbook.

Welton, J.S. & **Ladle, M.** (2015). An experimental treatment of *Simulium posticatum* with *Bti* at selected sites on the River Stour, Dorset. ***Report to North Dorset District Council***, pp 10.

Ladle M. (2015-2016). Monthly features for Sea Angler magazine published by Bauer Media.

Lavictoire, L., Moorkens, E., Ramsey, A.D., Sinclair, W & **Sweeting, R.A**. Hydrobiologia 766, 1, pp 89-102. Effects of substrate size and cleaning regime on growth and survival of captive-bred juvenile freshwater pearl mussels, *Margaritifera margaritifera* (Linnaeus, 1758).

Pentecost, A. (2015). In search of the Welsh *Tetracyclus*. Phycologist No. 88; 42-43. Slippery when wet: the role of algae in Mountain Accidents. Alpine Journal 119: 218-223.

Wallace, I., (2016). Natural England Commissioned Report NECR191. A review of the status of the caddis flies (Trichoptera) of Great Britain Trichoptera Species Status No.27, pp 132.

THE FRESHWATER BIOLOGICAL ASSOCIATION
(A COMPANY LIMITED BY GUARANTEE)
TRUSTEES' REPORT FOR THE YEAR ENDED 31ST MARCH 2016

The members of the Council of the Freshwater Biological Association (the Association), acting as Trustees of the Association submit their Annual Report and audited Accounts for the year ended 31st March 2016.

The financial statements comply with the Charities Act 2011, the Companies Act 2006, the Memorandum and Articles of Association, and Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard for Smaller Entities (FRSSE 2015).

Trustees
The Trustees of the Freshwater Biological Association during the period 1st April 2015 to 31st March 2016 are listed on page 33 of the Trustees' Report. The majority of the members of the Council of Trustees are nominated by either the Council or the general membership and proposed for election at the AGM. These appointments are for four years and Council Trustees cannot be elected for a further term until one year has elapsed since the end of their previous term of office. A further two Trustees are nominated by The Royal Society and the Fishmongers' Company. A review of Trustees' skills is periodically undertaken and this is used to inform the nomination process for prospective Trustees.

Statement of Trustees' Responsibilities
The Trustees are responsible for preparing the Annual Report and the Financial Statements in accordance with applicable law and regulations.

Company law requires the Trustees to prepare financial statements for each financial year which give a true and fair view of the state of affairs of the Association and of the surplus or deficit of the Association for that period. In preparing those financial statements, the Council is required to:

- select suitable accounting policies and apply them consistently
- make judgements and estimates that are reasonable and prudent
- prepare the financial statements on the going concern basis unless it is inappropriate to assume that the Association will continue its activities.

The Trustees are responsible for the management of the Association's activities in accordance with its Memorandum and Articles of Association and for the keeping of proper accounting records which disclose with reasonable accuracy the financial position of the Association and which enables the Trustees to ensure that the financial statements comply with the Companies Act 2006. They are also responsible for safeguarding the assets of the Association and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities. A review of Trustees' skills is periodically undertaken and this is used to inform the nomination process for prospective Trustees.

In accordance with company law, as the Trustees of the Association, we confirm that:

- So far as we are aware, there is no relevant audit information of which the Association's auditors are unaware; and
- We have taken all the steps that we ought to have taken in order to make ourselves aware of any relevant audit information and to establish that the Association's auditors are aware of that information.

Status
The Association is a Company Limited by Guarantee (registered number 263162) and a registered Charity (registered number 214440). The Council of Trustees have no interests in the Association as defined by the Companies Act 2006 and receive no remuneration for their services to the Association. The Association's Trustees do receive reimbursement of travel and subsistence costs necessarily incurred in the performance of their duties. The liability of the Members is laid out in clauses 7 and 8 of the Articles of Association and limits the liability of the members to £10 each.

The Trustees of the Association meet twice yearly (more frequently when necessary) to discuss and review the strategic direction of the Association; the operational activities of the Association are fully delegated to the Chief Executive. A sub-committee of the Council, the Finance and General Purposes Committee, has delegated strategic responsibilities and meets on a regular basis to receive reports on activities from the Chief Executive, Finance Manager and Head of Business. The terms of reference for the Finance and General Purposes Committee are reviewed periodically by the Council of Trustees. The delegation of authority to the Chief Executive is also reviewed by the Council of Trustees.

THE FRESHWATER BIOLOGICAL ASSOCIATION
TRUSTEES' REPORT FOR THE YEAR ENDED 31ST MARCH 2016
(Continued)

Objectives of the Charity

The objects of the Association, as defined by its Memorandum, are to promote the investigation of the biology (in the widest interpretation of the word) of the animals and plants and other organisms found in fresh (including brackish) waters, and to promote the sound and sustainable management of freshwater ecosystems and resources. The current strategic objectives are:

- to widen active membership;
- to provide evidence and information;
- to influence and broaden advocacy;
- to facilitate the setting of the research agenda.

Review of Activities

The changes and developments referred to in the Trustees' report for the year 2014-2015 are in progress. Following the staffing review, a number of new appointments have been made. With regard to the capital projects, the biomass heating plant has been completed, and conversion for the Ferry House Annexe is underway. Business Plan development and review of governance are proceeding.

The operating deficit before net loss on investments (£107,131) is £308,659 (2015 £344,261). Cashflow was funded by the withdrawal of £704,000 from the Investec investment portfolio. The significant increase in withdrawal from the investments was to fund the biomass boiler installation, the Annexe conversion and the organisational changes, plus an increase in salaries of 27%, as approved by Council. Total Income included a substantial legacy of £286,328 received from Rosemary Lowe-McConnell's Estate.

Income from Scientific Projects included the Biffa Award of £1.46 million; a three year Pearl Mussel project, involving 5 partners in England, which commenced in March 2015, and has two years to run. A Project Manager was appointed in June 2015. The Freshwater Pearl Mussel ARK Project also continued with support from Natural England (NE) and the Environment Agency (EA).

Income from Data and Information projects included Syngenta and ASFA projects.

There was a small reduction in Membership numbers during the year due to transfers between categories. The FBA on-line Membership system went live during the year and offers more flexibility for people wishing to join or renew their membership. Publications income overall increased by over 23%.

An increase in the amount of rental and facilities income was generated from the Windermere site. The Windermere Ferry income was similar to the previous year. This winter the ferry was regularly out of service, caused by the lengthy period of severe storms and flooding. Road access to many areas of South Lakeland was also affected for several weeks. The River Laboratory at East Stoke was the main area of activity for generating funds through the rental of facilities, both long and short term.

Expenditure showed an increase during 2016 and included the final amount of £43,740 in professional fees for consultancy related to organisational change. This change, with related financial controls, was not fully implemented until the last quarter of the year. The significant increase in expenditure was on salaries, which were attributable to these changes to the organisation. The Chief Executive has been in post for the full year and 7 full-time staff joined during the second and third quarters. Three of the new staff replaced vacant posts.

The scientific research activity and funding of grants is considered by the Trustees to be a major contribution towards the FBA's compliance with the Public Benefit Test as laid out in The Charities Act 2011. The various public activities including educational outreach, speaking at conferences and running subsidised training courses, also add to this compliance, as does support for students on placements at FBA sites.

Financial Reserves Policy
The purpose of the Association's reserves is to provide sufficient protection for the Association against changing financial circumstances and to maintain the long term viability of the Association in order to promote its principal charitable objectives. The level of reserves, as reflected in the Unrestricted General Fund Account, and including the revaluation reserve, is represented by tangible assets, net current assets and a liquid investment asset reserve. The remaining unrestricted designated funds are made up entirely of liquid investment assets, currently invested on the UK Stock Exchange. These reserves are considered sufficient for the Association to meet its short to medium term expenditure obligations.

Investment Policy
The Association's investments are detailed in Note 13(b) to the Financial Statements. The Trustees approved an Investment Policy in December 2005, which provides the framework for the complete investment portfolio of the Association. The policy states that the portfolio should be structured to provide a balanced return between income and capital growth, whilst being sufficiently diversified to spread risk. The Trustees ensure that any investments held reflect the ethical considerations of the Association and that no investment shall be held that is contrary to its objectives.

The Investment Policy was reviewed by the Trustees in March 2009 and no changes were made.

Plans for Future Periods
The implementation and restructuring of the FBA staff was completed and commenced in July 2015. All posts were filled by November 2015. The transition from the old business structure and operating model continued throughout the year.

The Acting Chair was elected as Chair at the AGM in September, which also saw the retirement of the existing Treasurer and the election of the new Treasurer onto Council.

The delivery of the Business Plan has progressed following detailed scrutiny by the new Senior Management Team, and the budget that subsequently developed is anticipated to be in operation by September 2016. The 'invest to save' approach adopted by Council in 2015 provided the capacity and capability to ensure the sustainable future of the organisation so that staff can develop and market our services.

The ongoing review of governance will be completed following presentation of the revised Memorandum and Articles of Association at the AGM in October 2016.

The use of reserves to develop our estate to generate income has continued with the development of the Annexe at Windermere which is due to be completed in early 2017 and will bring added rental income. In addition planning permission for potential changes to property at East Stoke is in progress to generate further rental income.

Risk Management
During the year the Trustees reviewed the risks to which the Association is exposed and any changes were updated in the Association's Corporate Risk Register. This document approved by the Council of Trustees is reviewed annually by the Council of Trustees as part of its governance arrangements. Council identified that the Corporate Risk Register needed a significant review and a draft framework was approved at the end of the year. The new format and framework will be completed during 2016/17.

Public Benefit Test
Under the terms of The Charities Act 2011, the Trustees have a statutory duty to report on the Association's compliance with the Public Benefit Test. The Trustees consider that the aims and objectives of the Association are able to deliver a public benefit and have given due regard to that fact.

THE FRESHWATER BIOLOGICAL ASSOCIATION
TRUSTEES' REPORT FOR THE YEAR ENDED 31ST MARCH 2016
(Continued)

Trustees
The following were members of the Council during the year, appointed in accordance with the Articles of Association.

President
Prof. Sir John R. Beddington CMG

Chairman of Council
Mr G.R. Bateman OBE (from September 2015)

Honorary Treasurer
Mr P.M. Andrewes (to September 2015)
Mr R. A. W. Middleton (from September 2015)

Representative Members

The Fishmongers' Company	Mr A. Wallace
Royal Society	Prof. R. Battarbee FRS

Elected Members
* Ms F. Bowles
* Dr A. Crowden (co-opted from September 2015)
* Dr E. Dollar (co-opted from September 2015)
* Dr I.G. Dunn
Prof. S.J. Hawkins
Dr P. Shaw (to October 2016)

* Co-opted members.

The above report has been prepared in accordance with the special provisions of Part 15 of the Companies Act 2006 relating to small companies.

The Ferry Landing
Far Sawrey, Ambleside
Cumbria, LA22 0LP

Dated this 12th July 2016
By Order of the Council

Mr G.R. Bateman OBE
Chair of Council

THE FRESHWATER BIOLOGICAL ASSOCIATION
STATEMENT OF FINANCIAL ACTIVITIES
(INCLUDING INCOME AND EXPENDITURE ACCOUNT)
FOR THE YEAR ENDED 31ST MARCH 2016

Incoming Resources		Unrestricted Funds		Total	Total
Incoming resources from generated funds	**Note**	General	Other	2016	2015
		£	£	£	£
Voluntary income:					
Awards and donations	4	292,701	-	292,701	4,121
Activities for generating funds	5	180,196	40	180,236	200,527
Investment income & bank interest	6	42,482	2,128	44,610	58,229
		515,379	2,168	517,547	262,877
Incoming resources from charitable activities:	7				
Membership services		25,023	-	25,023	25,080
Scientific publications and journals		80,099	-	80,099	65,297
Scientific research & activity		472,329	-	472,329	100,112
FBA Library/Data & Information Services		25,326	-	25,326	172,904
Training courses & meetings		29,542	-	29,542	64,909
		632,319	-	632,319	428,302
Total incoming resources		**1,147,698**	**2,168**	**1,149,866**	**691,179**
Resources expended					
Cost of generating funds	8	310,436	-	310,436	180,526
Costs of charitable activities:	9				
Membership services		71,431	-	71,431	38,615
Scientific publications and journals		94,864	-	94,864	85,602
Scientific research & activity		525,737	3,974	529,711	241,755
FBA library/Data & Information Services		169,834	-	169,834	264,738
Training courses and meetings		89,464	-	89,464	78,659
Governance costs	10	192,785	-	192,785	145,545
Total resources expended		**1,454,551**	**3,974**	**1,458,525**	**1,035,440**
Net (expenditure) for the year before transfers and other recognised gains/(losses)		(306,853)	(1,806)	(308,659)	(344,261)
Transfer between funds	17	(958)	958	-	-
Net (loss)/gain on investments	13b	(93,976)	(13,155)	(107,131)	196,290
Gain on the revaluation of Tangible Assets	18	-	-	-	119,020
Net movement of funds in year		**(401,787)**	**(14,003)**	**(415,790)**	**(28,951)**
Reconciliation of funds					
Total funds brought forward 2015		2,504,541	2,631,947	5,136,488	5,165,439
Total funds carried forward 2016		2,102,754	2,617,944	4,720,698	5,136,488

All incoming resources and resources expended derive from continuing activities and the Statement of Financial Activities includes all gains and losses recognised in the year.

The total net loss on investments of £107,131 (2015: total net gain of £196,290) includes realised losses of £32,132 (2015: realised losses of £102,780) attributable wholly to the General Fund Account.

THE FRESHWATER BIOLOGICAL ASSOCIATION
BALANCE SHEET AS AT 31ST MARCH 2016
COMPANY NUMBER 263162

	Note	2016		2015
		£	£	£
Fixed Assets				
Tangible	13a		2,361,763	2,005,187
Investments	13b		2,300,563	3,111,694
			4,662,326	5,116,881
Current Assets				
Debtors and Prepayments	14	139,499		128,298
Cash at Bank and in Hand		199,498		85,335
		338,997		213,633
Less Current Liabilities				
Creditors (due within 1 year)	15	(280,625)		(194,026)
Net Current Assets			58,372	19,607
Total Assets Less Current Liabilities			£ 4,720,698	£ 5,136,488
Representing Members' Funds				
Unrestricted				
General Fund	16		1,734,243	2,128,520
Designated Funds	17		2,617,944	2,631,947
Revaluation Reserve	18		368,511	376,021
			£ 4,720,698	£ 5,136,488

These accounts have been prepared in accordance with the special provisions relating to small companies within Part 15 of the Companies Act 2006.

Approved on behalf of Council by Mr G. R. Bateman OBE, Chair 12th July 2016

THE FRESHWATER BIOLOGICAL ASSOCIATION
(Limited by Guarantee)
NOTES TO THE ACCOUNTS

1. Status

The Association is a Company Limited by Guarantee and not having a Share Capital. The liability of the Members who constitute the Association is limited to £10 per Member. An elected Council of Trustees who constitute honorary directors of the Association for Companies Act purposes manages the affairs of the Association. Details of the Council Members are given in the Trustees' Report.

2. Accounting Policies

(a) Accounting Convention

These accounts have been prepared under the Historical Cost Convention as modified by the revaluation of fixed assets (note 13) and provide the required information in accordance with the Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard for Smaller Entities published on 16th July 2014, the Financial Reporting Standard for Smaller Entities (effective January 2015) and the Companies Act 2006.

(b) Fund Accounting

The General Fund is made up of unrestricted funds, which are available for use at the discretion of the Trustees of the Association in the furtherance of the general objectives of the Association.

Designated funds represent unrestricted funds that have been bequeathed, donated or set aside by the Trustees of the Association for the furtherance of its activities by means of specific sponsorship.

(c) Incoming Resources and Resources Expended

Membership, Life Membership, donations, and other voluntary income is included only when received, whilst all other income, such as rent, publications, ferry commission, and confirmed grant income is accounted for on a receivable basis. Grant income is deferred when it relates to activities in future periods. All expenditure is accounted for on an accruals basis, net of VAT. Irrecoverable VAT is expensed in the statement of Financial Activities under the heading of Governance costs. Directly attributable costs are charged in full to the relevant activity; indirect costs are apportioned across all activities based on the relative proportion of space occupied and staffing costs.

(d) Tangible Assets and Depreciation

Freehold property at Windermere and East Stoke was revalued during the year ended 31st March 2015 using an 'existing use' basis, in line with FRS15. The Freshwater Biological Association has adopted FRS15 and will formally revalue its property class of tangible assets every five years. Depreciation will be charged in future years on the buildings element only, which represents approximately 60% of the total value of this class of tangible assets. Scientific apparatus and other equipment below the value of £1,000 are not capitalised.

Depreciation is charged on a straight line basis, in order to write off the assets over their useful economic lives as follows:

Buildings over 50 years
Computer and Other Equipment over 4 years
Scientific Equipment over 5-10 years

(e) Library and Stocks

No value is attributable in these accounts to the library or to stocks of publications as their net value is not considered material.

(f) Cash Flow

The FBA is considered a small reporting entity for the purposes of FRS1 and is exempted from producing a cash flow statement.

(g) Investments

The value of the investments which are held as part of the Association's investment portfolio are restated at market value.

THE FRESHWATER BIOLOGICAL ASSOCIATION
NOTES TO THE ACCOUNTS (Continued)

3. Net (outgoing) resources for the year

This is stated after charging:

	2016	2015
	£	£
Depreciation	37,202	40,168
Auditors' remuneration	3,100	3,000

Incoming Resources	Unrestricted Funds General	Other	2016	2015
	£	£	£	£
4. Awards and Donations				
Membership donations	361	-	361	446
Legacies and other donations	288,733	-	288,733	1,152
Gift Aid	3,607	-	3,607	2,523
	292,701	-	292,701	4,121
5. Activities for generating funds				
Land and building income:				
Windermere	30,040	-	30,040	15,873
East Stoke	131,312	-	131,312	165,661
Windermere ferry contract	17,652	-	17,652	18,093
Miscellaneous income	1,192	40	1,232	900
	180,196	40	180,236	200,527
6. Investment income				
Bank deposit interest	207	-	207	198
Investment Income	42,275	2,128	44,403	58,031
	42,482	2,128	44,610	58,229
7. Charitable activities				
Membership services	25,023	-	25,023	25,080
Scientific and special publications	24,421	-	24,421	17,499
Journals	55,678	-	55,678	47,798
Research contracts	63,226	-	63,226	40,112
Scientific research & activity, direct funding and grants	409,103	-	409,103	60,000
Data & Information Services	15,940	-	15,940	134,625
FBA Library	9,386	-	9,386	38,279
Training courses and meetings	29,542	-	29,542	64,909
	632,319	-	632,319	428,302

THE FRESHWATER BIOLOGICAL ASSOCIATION
NOTES TO THE ACCOUNTS (Continued)

Resources Expended	Unrestricted Funds General £	Other £	2016 £	2015 £
8. Cost of generating funds				
Land and buildings:				
Windermere	19,817	-	19,817	5,283
East Stoke	275,174	-	275,174	163,350
Windermere ferry contract	15,445	-	15,445	11,893
	310,436	-	310,436	180,526
9. Cost of charitable activities				
Membership services	71,431	-	71,431	38,615
Scientific and special publications	37,362	-	37,362	48,466
Journals	57,502	-	57,502	37,136
Research Contracts	60,718	-	60,718	175,111
Scientific research activity, direct funding and grants	465,019	3,974	468,993	66,644
Data & Information Services	142,076	-	142,076	164,738
The FBA library	27,758	-	27,758	100,000
Training courses and meetings	89,464	-	89,464	78,659
	951,330	3,974	955,304	709,369
10. Governance Costs				
Council meetings and reimbursements to Trustees	10,966	-	10,966	9,154
Other costs – direct and indirect:				
Audit fees	3,100	-	3,100	3,000
Other professional fees	79,424	-	79,424	95,946
Staff costs	60,083	-	60,083	30,449
Irrecoverable VAT	39,212	-	39,212	6,996
	192,785	-	192,785	145,545

11. Staff

Average number of employees was 26 (19 FTE) paid employees (2015: 24 (19 FTE)) during the year to 31st March 2016.

Total Staff Costs in the year were:	2016 £	2015 £
Salaries	638,954	498,924
Employer's National Insurance Contributions	51,104	30,427
Employer's Pension contributions	42,999	46,129
Total	733,057	575,480

There were no employees in the remuneration band £60,000 to £69,999, or above (2015: none).

12. Trustee Remuneration

No members of Council received any remuneration during the year. One member of Council received an honorarium of £800 (2015: £865) for services as FBA Books Editor, unrelated to his/her position as Trustee. Travel costs and Council expenses amounting to £10,966 (2015: £9,154) were paid for or reimbursed to 8 (2015: 9) members of Council.

THE FRESHWATER BIOLOGICAL ASSOCIATION
NOTES TO THE ACCOUNTS (Continued)

13. Fixed Assets

(a) Tangible

	Freehold Land & Buildings	Computer and other Equipment	Scientific Equipment	Total
	£	£	£	£
Cost or Valuation				
At 1st April 2015	1,960,000	147,360	26,034	2,133,394
Additions	77,647	316,131	-	393,778
Disposals	-	-	-	-
At 31st March 2016	2,037,647	463,491	26,034	2,527,172
Accumulated Depreciation				
As at 1st April 2015	-	107,377	20,830	128,207
Charge for the year	23,520	11,080	2,602	37,202
At 31st March 2016	23,520	118,457	23,432	165,409
Net book value				
At 31st March 2016	2,014,127	345,034	2,602	2,361,763
At 31st March 2015	1,960,000	39,983	5,204	2,005,187

The historical cost of Freehold Land & Buildings is £1,411,795 (2015: £1,334,148).

The Association revalued its Freehold Land and Buildings in line with FRS15 and adopted the revaluation of this class of assets at March 31st 2015. The valuations were carried out by external Independent Chartered Surveyors on a 'fair value' basis and undertaken by Peill and Co. for the land and buildings at the Windermere site and by Powis Hughes for the site at East Stoke in Dorset. The Council of Trustees consider that there has not been any material change to this valuation since the 31st March 2015 on an 'existing use' or 'fair value' basis.

(b) Investments

Quoted investments are valued in accordance with their UK Stock Exchange listings at the balance sheet dates.

	£	Quoted Investments £
Market Value at 1st April 2015		3,111,694
Additions/(Disposals)		(696,352)
Investment Management fees		(7,648)
Net Investment (Losses):		
Attributed to General Fund Account (Note 16)	(93,976)	
Gain on revaluation attributed to the Frost Bequest (Note 17)	(13,155)	
		(107,131)
Market Value at 31st March 2016		2,300,563

During the year, £704,000 of capital has been transferred from the account held at Investec (2015: £300,000) to assist with working capital requirements and the capital expenditure on the Biomass boiler.

THE FRESHWATER BIOLOGICAL ASSOCIATION
NOTES TO THE ACCOUNTS (Continued)

13. Fixed Assets (Cont)

	Quoted Investments £
Acquisition Values	1,361,043
Represented by:	
Investments held on UK Stock Exchange	2,279,381
Cash held as part of Portfolio	21,182
	2,300,563

The principal investments at 31st March 2016 were:

	Market Value £	% of Total %
M & G Charifund		
19,366 Income Units	274,052	11.9
6,026 Accumulation Units	1,187,043	51.6
J P Morgan Asset Management Ltd		
204,355 Bond Units – A & B Funds	279,711	12.2
117,752 UK Equity Fund Units	311,497	13.5
	2,052,303	89.2

The accumulated units received during the year that were reinvested for capital growth had a cash value equivalent of £71,077 (2015: £66,300).

14. Debtors

	2016 £	2015 £
Trade Debtors	27,399	18,091
Other Debtors	64,859	65,879
Prepayments	28,865	44,238
VAT Debtor	18,376	-
	139,499	128,298

15. Creditors

PAYE, NIC and pension	22,453	22,579
Trade Creditors	138,962	78,567
Other Creditors and Accruals	44,991	23,236
Deferred income	74,219	62,716
VAT creditor	-	6,928
	280,625	194,026

16. General Fund Account

	2016 £	2015 £
General Fund Account		
Balance brought forward	2,128,520	2,309,866
Net movement in funds before transfers and other recognised gains	(308,659)	(344,261)
	1,819,861	1,965,605
Transfer net movement to Other Funds (Notes 4 to 10)	1,806	2,554
Unrealised (loss) gain arising from revaluation of Investments (Note 13b)	(93,976)	153,692
Transfer from Revaluation Reserve (Note 18)	7,510	6,794
Transfer between Funds (Note 17)	(958)	(125)
	1,734,243	2,128,520

THE FRESHWATER BIOLOGICAL ASSOCIATION
NOTES TO THE ACCOUNTS (Continued)

17. Other Funds

	31.3.2015	Income	Expenditure	Transfers	31.3.2016
	£	£	£	£	£
Unrestricted Designated					
Fritsch Fund	-	40	-	-	40
Frost Bequest	627,363	(13,155) *	-	-	614,208
Frost Exhibition	1,568	2,128	-	-	3,696
Gilson Le Cren Fund	3,016	-	3,974	958	-
Freshwater Science Fund	2,000,000	-	-	-	2,000,000
Total	2,631,947	(10,987)	3,974	958	2,617,944

*Loss on revaluation of investments (note 13b)

The balances of these funds are included in the Balance Sheet totals of Assets and the portions attributed to the Unrestricted Funds are:

	31.3.2016	31.3.2015
	£	£
Tangible Fixed and Current Assets	317,381	73,851
Quoted Investments	2,300,563	2,558,096
	2,617,944	2,631,947

Unrestricted Designated Funds represents sums bequeathed, donated, or established by Council to the Association for the furtherance of its charitable activities by means of specific sponsorship, but expendable at the discretion of the Trustees. Briefly:

Fritsch Fund – fund established to support the scientific collection of algal illustrations together with taxonomic references.
Frost Bequest – the fund was established from a bequest from the estate of Winifred Frost. The purpose of the fund is to provide income and interest to the Frost Exhibition Fund and represents the original capital sum and accumulated capital growth.
Frost Exhibition – this fund represents the income and interest received from the investments associated with the Frost Bequest. The purpose of this fund is to support studentships and fellowships in freshwater biology and limnology and in particular, studies associated with freshwater fish.
Gilson Le Cren Memorial Fund – Formerly Hugh Cary Gilson Fund, renamed in 2013 following the bequest of £11,000 in 2012 from the estate of former FBA Director, David Le Cren. The fund provides a yearly award to support the freshwater research activities of members, irrespective of their organisation or status.
Freshwater Science Fund – this fund was established by Council in order to support the attainment of the FBA's core charitable activities. This represents a long term commitment by the Association to the promotion of freshwater science. In the short-term the Fund will be kept constant.

18. Revaluation Reserve

	£
Balance brought forward at 01.04.2015	376,021
Surplus on revaluation	-
Transfer to general fund – difference on historical cost depreciation charge and actual depreciation charge on the revalued amount	(7,510)
Balance carried forward at 31.03.2016	368,511

19. Capital Commitments and Contingent Liabilities

There were capital commitments of approximately £850,000 for the conversion of the Ferry House Annexe and no contingent liabilities at 31st March 2016.

20. Taxation Status

As a Registered Charity (No 214440), the Association is not liable to Income and Corporation Taxes.

THE FRESHWATER BIOLOGICAL ASSOCIATION
NOTES TO THE ACCOUNTS (Continued)

21. FRS 17 Retirement Benefits

The Association participates in the Universities Superannuation Scheme (USS), a defined benefit scheme which is externally funded and contracted out of the State Second Pension (S2P). The assets of the scheme are held in a separate trustee-administered fund, the Universities Superannuation Scheme Ltd being the Trustee. Because of the mutual nature of the scheme, the scheme's assets are not hypothecated to individual institutions and a scheme wide contribution is set. The Association is therefore exposed to actuarial risks associated with other institutions' employees and is unable to identify its share of the underlying assets and liabilities of the scheme on a consistent and reasonable basis as required by FRS 17 and it therefore accounts for the scheme as if it were a defined contribution scheme. The amount charged to the income and expenditure account represents the contributions payable to the scheme in respect of the accounting period.

The most recent actuarial valuation was carried out as at 31 March 2014. The Pensions Act 2004 and the Scheme Funding Regulations issued in 2005 require schemes to adopt the Statutory Funding Objective – to have sufficient and appropriate assets to cover their 'technical provisions'. Under legislation, the assumptions underlying the technical provisions are set by the Trustee after consultation with the Employers. The assumptions include margins for prudence that the Trustee considers appropriate given the Employer's willingness and ability to support the Scheme (the "employer covenant"). In relation to the past service liabilities the financial assumptions were derived from market yields prevailing at the valuation date.

At the valuation date (March 2014), the market value of the assets of the scheme was £41.6 billion and the value of the scheme's technical provisions was £48.8 billion indicating a deficit of £7.2 billion. The funding level was 85% of the benefits which had accrued to members after allowing for expected future increases in earnings.

The Trustee has determined (after consultation with the Employers) a plan to address the scheme's deficit. The updated recovery plan requires employers to contribute 2.1% of salaries towards the deficit over a period of 17 years.

The USS pension scheme is now closed to new employees within the FBA and an alternative defined contribution stakeholder pension scheme is offered with Scottish Widows.

The total pension cost for the Association for the year to 31st March 2016 was £42,999 (2015: £46,129) which was 16% of pensionable salaries for the USS Pension and 9% of pensionable salaries for the Scottish Widows Pension.

Outstanding Pension contributions as at 31st March 2016 were £5,565 (2015: £6,695).

INDEPENDENT AUDITORS' REPORT TO THE MEMBERS OF THE FRESHWATER BIOLOGICAL ASSOCIATION

We have audited the financial statements of The Freshwater Biological Association for the year ended 31st March 2016 which comprise the Statement of Financial Activities, the Balance Sheet and the related notes. The financial reporting framework that has been applied in their preparation is applicable law and the Financial Reporting Standard for Smaller Entities (effective January 2015) (United Kingdom Generally Accepted Accounting Practice applicable to Smaller Entities).

This Report is made solely to the Association's Members, as a body, in accordance with Chapter 3 of Part 16 of the Companies Act 2006. Our audit work has been undertaken so that we might state to the Association's Members those matters we are required to state to them in an Auditor's Report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the Association and its members as a body, for our audit work, for this Report, or for the opinions we have formed.

Respective responsibilities of trustees and auditor
As explained more fully in the Trustees' Responsibilities Statement set out on page 30, the Trustees (who are also the directors of the charitable company for the purposes of company law) are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view.

Our responsibility is to audit and express an opinion on the financial statements in accordance with applicable law and International Standards on Auditing (UK and Ireland). Those standards require us to comply with the Auditing Practices Board's Ethical Standards for Auditors.

Scope of the audit of the financial statements
An audit involves obtaining evidence about the amounts and disclosures in the financial statements sufficient to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or error. This includes an assessment of: whether the accounting policies are appropriate to the Association's circumstances and have been consistently applied and adequately disclosed; the reasonableness of significant accounting estimates made by the Trustees; and the overall presentation of the financial statements. In addition, we read all the financial and non-financial information in the Trustees' Report to identify material inconsistencies with the audited financial statements and to identify any information that is apparently materially incorrect based on, or materially inconsistent with, the knowledge acquired by us in the course of performing the audit. If we become aware of any apparent material misstatements or inconsistencies we consider the implications for our report.

Opinion on financial statements
In our opinion the financial statements:

- give a true and fair view of the state of the Association's affairs as at 31st March 2016 and of its incoming resources and application of resources, including its income and expenditure, for the year then ended;
- have been properly prepared in accordance with United Kingdom Generally Accepted Accounting Practice applicable to Smaller Entities; and
- have been properly prepared in accordance with the Companies Act 2006.

Opinion on other matter prescribed by the Companies Act 2006
In our opinion the information given in the Trustees' Report for the financial year for which the financial statements are prepared is consistent with the financial statements.

Matters on which we are required to report by exception
We have nothing to report in respect of the following matters where the Companies Act 2006 requires us to report to you if, in our opinion:

- adequate accounting records have not been kept or returns adequate for our audit have not been received from branches not visited by us; or
- the financial statements are not in agreement with the accounting records and returns; or
- certain disclosures of Trustees' remuneration specified by law are not made; or
- we have not received all the information and explanations we require for our audit; or
- the Trustees were not entitled to prepare the financial statements in accordance with the small companies regime and take advantage of the small companies exemption in preparing the Trustees' Report and from the requirement to prepare a Strategic Report.

91 Gower Street
London
WC1E 6AB
12th July 2016

Dean Cates BA, FCA (Senior Statutory Auditor)
for and on behalf of Couch Bright King & Co
Chartered Accountants &
Statutory Auditors