# EIGHTY-THIRD

# ANNUAL REPORT

## OF THE

## FRESHWATER BIOLOGICAL ASSOCIATION

and Accounts for the year ended 31st March 2015

A Company Limited by Guarantee
Registered No. 263162, England

Registered Charity No. 214440

Registered Office:
The Ferry Landing, Far Sawrey, Ambleside, Cumbria LA22 0LP, UK

Published by the Freshwater Biological Association,
The Ferry Landing, Far Sawrey, Ambleside, Cumbria LA22 0LP, UK



ISSN 0374-7646

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## 31st MARCH 2015

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Sir Martin Holdgate, CB
Professor Sir Frederick Holliday, CBE
Mr J. Jeffery, CBE
Dr J.W.G. Lund, CBE (to 21/03/15)
Professor Sir William Stewart
Dr J.F. Talling
The Duke of Wellington, MVO, OBE, MC, DL
The Duke of Westminster, OBE, DL

*Chair of Council*
Mr G. Bateman, OBE (Acting Chair)

*Honorary Treasurer*
Mr P. Andrewes

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The Royal Society – Professor R. Battarbee

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Dr A. Crowden
Dr E. Dollar
*Dr I.G. Dunn
Professor S. Hawkins
Dr P. Shaw

* Co-opted Members

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Mr P. Andrewes
*Ms. F. Bowles
J. Davy-Bowker
*Professor C.S. Reynolds

**Mr S. Pawley (Business Manager)
**Mrs J. Lomax (Finance Manager)

* Co-opted Members
** Attendees

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Dr R.B. Angus
Dr R.G. Bailey
Dr I.A.E. Bayly
J.A. Black
B. Blofield
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M. Thompson
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The Duke of Westminster
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F.M. Wiseman

## COMPLEMENT AT 31st MARCH 2015

| | |
|---|---|
| Acting Director | John Davy-Bowker (to 01/02/15) |
| Chief Executive/Director | Dr Bill Brierley (from 02/02/15) |
| Personal Assistants to the Director | Sarah Johnson/Julie McNicol |
| | |
| Business Manager/Training and Journals | Simon Pawley |
| Finance Manager | Judith Lomax |
| Finance and Administration Assistants | Carolyn Fletcher/Sarah Rigby |
| Administration Assistant, Windermere | Lynda Durrell |
| Administration Assistants, East Stoke | Stephanie Smith/Michelle Stracey |
| Facilities Management, Windermere | Matthew Freeman |
| Domestic Assistant, Windermere | Jonathan Freeman |
| | |
| Research and Facilities Manager, East Stoke | John Davy-Bowker |
| IT Support Manager | Vanya Gordon |
| Pearl Mussel Project/Journals | Louise Lavictoire |
| Pearl Mussel Project Officer | Eloy Benito-Reyes |
| | |
| Data and Information Services | |
| Collections Manager | Tamsin Vicary |
| Bioinformatics and Web Development Manager | Dr Michael Haft |
| Web Developers | Simon Fox/Nick Bywell |
| Project Manager | Thomas Miles |
| Knowledge Transfer | |
| Science and Publications/Knowledge Transfer Manager | Dr Karen J. Rouen (to 04/03/15) |
| Training and Education | Dr Melanie Fletcher |
| Knowledge Transfer Assistant | Rosalind Maberly |
| | |
| Support Officer (casual appointment) | Soraya Alvarez |
| | |
| Support Officer (casual appointment) | Gary Rushworth |

*Approximately half the staff are employed on part-time contracts*

| | |
|---|---|
| *Honorary Posts* | |
| Honorary Curator of the Fritsch Collection | Dr Elizabeth Y. Haworth |
| Honorary Information Science Fellow | Ian Pettman |
| | |
| Honorary Research Fellows: | Professor Patrick Armitage |
| | Professor J. Malcolm Elliott |
| | Dr D. Glen George |
| | Terence Gledhill |
| | Dr Elizabeth Y. Haworth |
| | Professor Alan G. Hildrew |
| | Dr Mike Ladle |
| | Dr Allan Pentecost |
| | Dr Paul J. Raven |
| | Professor Colin S. Reynolds |
| | Dr Roger A. Sweeting |
| | Dr Ian Wallace |
| | |
| Honorary Editors: | |
| *FBA Books* | Dr Alan Crowden |
| *FBA News* | Dr Jonathan Grey |
| *Freshwater Reviews* | Professor Colin S. Reynolds |

*Registered Auditors:*
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*Bankers:*

The Cooperative Bank
147 Church Street
Preston PR1 3UD

CAF Bank Ltd
25 Kings Hill Avenue
Kings Hill, West Malling
Kent ME19 4JQ

# Foreword from the President

It has been a hard year for the Freshwater Biological Association with the loss of some giants of our past, Dr John W. G. Lund and Dr Rosemary (Ro) Lowe-McConnell - we are unlikely to see their like again. The development of new structures, governance and management arrangements, including the appointment of a new Chief Executive has been unsettling and will take some further time to settle down. I am proud of the staff and Council of the FBA who have continued to deliver a very high quality of performance in pursuit of our aims and objectives during a time that, for many, was when there was uncertainty of their own future roles. The reorganisation is now behind us with the exception of a few key appointments and the teams are in place to pursue our new agenda. I look forward to assisting with the delivery of a sustainable business, balancing the books and focussing on our core work, whilst developing commercial opportunities that accord with our charitable objects.

The environment continues to reflect the stresses and strains of man's misuse and neglect. The race for hydrocarbons from 'fracking' in the US has resulted in a flood of cheap coal being used in the power stations of the UK causing failure of our air pollution targets. Another unsatisfactory climate change summit has left the maritime nations wondering how long their countries will survive the rise in sea levels as the ice caps continue to melt. We are seeing the beginnings of adaptation now that the mitigation battle is lost and over the next few decades we will undoubtedly see a failure of some ecosystems. Rivers in southern England are becoming warmer, salmonids are under stress in spite of the excellent work to plant trees alongside riparian margins and invasive species are tightening their grip across the freshwaters in the UK. Water scarcity in the south east is likely to get worse, irrigation of food crops is becoming more expensive and the provision of energy is as unsustainable today as it was a decade ago. Across the world conflict rages and terrorism diverts the attention of politicians and policy makers from defending the future survival of our species and the ecological services on which we depend. We at the FBA need to stand guard against the excesses of mankind and 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 we face but the signals in the ecology must be heeded and amongst the major problems with natural resources, fresh water is an essential resource which must be preserved and exploited sustainably.

The FBA must be fit for purpose to deliver our strategy and the scientists and environmental managers today and tomorrow whilst continuing to be effective advocates for our work.

# Report from the Acting Chair/Chair of the Council

Change at the FBA, as with the environment and rest of the world, has dominated the activities of both Council and staff for several years. However, the pace of change has increased dramatically since March 2014 as we have started on the long overdue journey to reorganise and modernise the FBA to ensure our long term survival and financial sustainability. The increasing pace of change has, at times, been unsettling for Council and staff. However there have been many positive changes and you will see this in the report of Activities from the Acting Director.

Several important Council meetings where key decisions were made, were held throughout the year and the way in which Council works were changed to meet the requirement of an organisation going through change. This included setting up three sub-groups of Council to lead and oversee core areas of change, namely staff, estates and governance. These groups met or had teleconferences, as required, to progress business and this fed back to full Council. Council agreed to use our investments to further develop i) our organisational structure, starting with a review of staff, ii) our estate, by developing the Annexe into holiday flats and investigating other opportunities for our estate and iii) reviewing our governance,

including the updating of our Memorandum of Articles. This work continued and significant progress was made in all areas, including the recommendation by the staff sub-group to recruit a new Chief Executive/Director to lead the organisation forward. Our new Chief Executive started in February 2015.

Bill Brierley stood down as Chair in December 2014 and Geoff Bateman was co-opted to the role of Acting Chair until the AGM in 2015. We worked hard together to ensure a smooth transition and continued the essential work required with minimal interruptions.

Council also acknowledged that the financial operating position was likely to continue in deficit and accept that this is likely to increase in the short-term as we undertake the changes and a "invest to save" approach has been the preferred option to secure our future.

The need to communicate throughout this period of change was essential and several workshops including all Trustees, Staff and HRFs have taken place during the year, more regular staff meetings have been held - John Davy-Bowker and the Chair/Acting Chair made themselves available as much as possible to speak to staff and HRFs. Frequent communiqués have also been issued throughout the year to keep staff updated on developments.

We would like to thank our Acting Director, John Davy-Bowker, all of the staff, volunteers and trustees for their dedication, support and hard work over the last year. We feel that we have turned a corner and made a good start to our journey ahead.

# Report of Activities from the Acting Director/Chief Executive/Director

This is my second annual report as Acting Director of the Freshwater Biological Association (FBA) and in this report I will begin by summarising the strategic developments that have taken place over the last 12 months. It has been an exciting year of stabilisation, planning and change for the Association, and there is much to report.

This reporting period of 1st April 2014 to 31st March 2015 also overlaps with the handover between myself as Acting Director and Dr Bill Brierley as our incoming Chief Executive, so whilst I will report on the majority of the year that has passed, including the development of our new Business Plan and general reports on our various activities, Bill will report on more recent developments including the staff review that started in February 2015. This report is therefore a joint report from the outgoing Acting Director and the incoming Chief Executive.

During 2014 work began in earnest to deliver this strategy with the development of a new Business Plan. A series of workshops during 2014 where FBA staff, Trustees and Honorary Research and Information Fellows, came together to develop joint thinking and proposals on how each area of FBA activity could be strengthened and re-invigorated. This was the first time in recent years that these three FBA constituents had come together to jointly tackle the strategic and financial challenges that the Association faces. The workshops were very productive and led to a shared view of what the FBA must do over the new few years. The outputs of the workshops fed into the new Business Plan.

A second process running in parallel to the workshops was the production of a financial model for the Association that allowed numerous different scenarios to be tested and evaluated for their resultant effect on the FBA's financial performance. This model took the ideas generated by the workshops and modelled projections of future financial performance for each area of FBA activity – setting moderate financial targets where these seemed appropriate, and higher ones where the ideas suggested that we could do better. After various stages of refinement, this financial model formed a second vital component in the production of our Business Plan.

## FBA Business Plan

During late 2014 work commenced on the production of a new FBA Business Plan. The draft Business Plan was circulated initially to Council, and then to staff, for comment. Following feedback and some further refinement, the Business Plan is now ready for finalising and adoption. As with all documents of this nature, the plan is a living document and will need to be refined as we progress, but we now have a plan for how the organisation will realise its strategic objectives and how it will achieve financial sustainability. It will be reviewed annually and updated as required.

The Business Plan runs from April 2015 to April 2020 and sets out the future direction of the Association in some detail. We also plan to make a summary version of the plan available on the FBA website so that FBA members can see the positive changes that are being made.

## Staff Review

The first stage of implementation of the Business Plan was to review the current (early 2015) staff structure to see if it was appropriately organised to deliver our goals:

1) to widen and retain an active membership that benefits from and is involved with the activities of the FBA
2) to be the preferred place to go for data and information about freshwaters
3) to maintain and deliver high quality training and education to a range of audiences
4) to deliver a wide range of high quality publications and products
5) to help set the freshwater research agenda, facilitating and co-coordinating its delivery but also undertaking targeted and focused research and consultancy projects.

Finally, before reviewing the detailed activities of the year that has passed, both John Davy-Bowker and Bill Brierley would like to extend a very large thank you to the FBA staff, the FBA Trustees and the FBA HRFs who have all contributed strongly and positively to the changes and realignment of the organisation that has been progressing over the past 12 months.

## Membership

The total number of members as at 31st March 2015 stood at 1157 (down 3.9% on the same period last year). A breakdown according to category is as follows:

| | | |
|---|---|---|
| Life members | 558 | |
| Individual members (full) | 472 | |
| Individual members (student) | 41 | |
| Corporate members | 7 | |
| Honorary members (incl. reciprocal) | 77 | |
| Founder members | 2 | |
| Total *(previous period)* | 1157 | *(1204)* |

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.

## Database and Web-development

The Defra Demonstration Test Catchment (DTC) Archive project was completed at the end of January 2015. Upon completion, and in order to better reflect the fact that the content that would be stored in the archive was much more than simply DTC Data, the final name of the archive was chosen as the Agricultural and Environmental Data Archive (AEDA). The

archive is available online at www.environmentdata.org where various data and information stored in it can be viewed by the public. Data from the Defra DTC platform is currently stored in the archive and once the scientists working on the project are ready to do so, it will be published and freely available for download. Defra will also be adding data from the Agricultural Greenhouse Gas Platform to the archive in due course.

In addition to a planned section of the FBA website solely dedicated to the FBA's own data holdings, AEDA now represents the central hub of all the FBA's digital data and information storage and development work, and will be the permanent home of all future digital information curated and managed by the FBA. This currently includes approximately 3500 grey literature reports from the Environment Agency (EA), digitised grey literature from the FBA library, and various reports added to the archive by the Atlantic Salmon Trust (AST). All of which are available now on the AEDA website.

Current FBA data projects involving AEDA's archival and publication facilities are the Defra Sustainable Intensification Platform, plus Syngenta's Pond Mescosm data, the latter of which will be available in the archive in August or September. Of the FBA's own data and information holdings it is expected that the FBA library catalogue will soon be added to AEDA and the FBA's own website.

In addition to the above, the FBA's Data and Information Services (DIS) have also been working on major upgrades to the FBA's own website. The new website is available to browse now (www.fba.org.uk) and its content will be gradually enhanced and extended over the coming months. In addition to refreshing our existing web pages, we are very pleased that in the near future we will also be able to support on-line membership administration, and host new services such as a discussion forum and blog. These new services should begin making their way to members and the public in the latter half of 2015.

**Collections**

The FBA's work on collections is closely related to the database and web-development work described above and in many cases our aim of making our collections accessible is achieved by making them electronic. We therefore seek to prioritise digitisation subjects and themes that deliver relevant information to FBA members, as well as seeking to provide cross-benefits to other areas of FBA activity.

*Digitisation Projects*

The Library and Information Service has been one of the most successful revenue generators in the scientific special library sector since the early 1980s. This year was no exception with £100,000 being secured in this period through three new contracts specifically for collection-related work, in addition to other project work with the Database and Web-development team above.

A contract to transfer 3,500 EA fisheries reports from the EA's database into the FBA online repository was completed on time. This contract also includes provision for another 100 EA reports to be added to the repository each year for the next five years.

Further work was done on digitisation for the ongoing AST project, and a new Aquatic Sciences & Fisheries Abstracts (ASFA) Trust Fund project was secured for producing catalogue records of 1,150 reports for completion in June 2015. Together, these initiatives will provide a very substantial collection of freshwater grey literature that will become available online and searchable through standard abstracting and indexing services. The collections will also be linked semantically to the DTC archive via our controlled vocabulary. Controlled vocabularies enable efficient search and retrieval of related items and the FBA's vocabulary was expanded (particularly with river catchment hierarchies) over the course of the year.

The FBA's first venture into oral history, the Heritage Lottery Fund (HLF) project *Clear Waters – An Oral History of People's Understanding of Fresh Water* was successfully completed and the results disseminated. A mobile exhibition was displayed at a range of venues during the year - our thanks go to Cumbria Wildlife Trust (CWT) for the loan of the equipment. A dedicated website (www.clearwaters.org.uk) was also produced.

Looking ahead, we are working with the National Trust (NT) to develop a new HLF proposal to catalogue and digitise grey literature and other information hosted by a range of environmental NGOs across the UK.

*The FBA Library*

The FBA received a donation of 13 boxes of literature from Dr David Solomon (Fisheries Consultant and Member of the AST's Scientific Advisory Panel). The boxes contain a mixture of published material and grey literature. This material will be processed as part of the FBA's ongoing project with the AST.

*The FBA Unpublished Collections*

In October 2014 Dr Nigel Holmes, the internationally renowned River Ecologist and friend to many FBA staff and members, sadly passed away. With the agreement of Nigel's family the FBA arranged to collect, sort and preserve his archive of river restoration materials as part of the FBA Unpublished Collections. In February 2015 the material was collected and an initial sort was carried out. Sixty boxes of national importance are now ready for further processing and indexing and the Association thanks Nigel's family for this very kind donation.

*The FBA Specimens and Sample Collections*

The FBA's extensive specimen and sample collections are housed in two locations, the Wet Laboratory Building and the basement of the Pearsall Building. In February 2015, following a flood, some of the specimen boxes were damaged by water ingress. These boxes will need replacing and the specimens examining for mould, followed by re-pinning. Ian Wallace (HRF) is liaising with the library to undertake this work and apply for a PRISM bid (The Preservation of Industrial and Scientific Material Fund) for further curation and display work in the future.

*International Collaboration, Representation and Agreements*

The FBA entered an agreement with the UN ASFA Secretariat in February 2015 to become the UK National Centre for the ASFA information system. This agreement will give the FBA continued free access to the ASFA Information System in exchange for producing records of UK aquatic publications for input to the database. It also enables the FBA to continue to bid for funding for relevant aquatic information projects to the ASFA Trust Fund.

Library staff represented the FBA at the UN ASFA Advisory Board Meeting in Beijing in October 2014, acting as Chair to the meeting and also giving a presentation on Data Archiving.

**Publishing**

*Books*

The *Guide to Freshwater Invertebrates* (FBA Scientific Publication No. 68; the 'Macan' book), and the *Guide to British Freshwater Macroinvertebrates for Biotic Assessment* (SP67) continue to sell well, with SP67 going into reprint in October 2014.

The FBA also has several revisions to existing book titles in preparation. The manuscript for the next Scientific Publication, a revision of SP40 the key to leeches, has been submitted by the authors Malcolm Elliott and Michael Dobson and is now at the proof-reading stage. Freshwater biologists and students needing to identify leeches to species and who may be interested in participating in user testing of this key prior to publication, are encouraged to contact the FBA. Further down the line, the first phase of the eagerly awaited new key to stoneflies by Mike Hammett is drawing to a close, work on a revision of the key to caseless caddis larvae (SP53) has started, and the new edition of the gastropod key (SP13) is progressing well.

*Journals*

The FBA continues to publish *Inland Waters,* on behalf of The International Society of Limnology (SIL). The journal maintains a healthy volume of copy. The 2013 Impact Factor dropped very slightly from 1.533 in 2012 to 1.432 in 2013 but this is still a very respectable score for a journal in its infancy.

Volume 7 of the FBA's own journal *Freshwater Reviews* was published and 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, through which a pay-to-view facility exists to access single papers. *Freshwater Reviews* continues its policy of making all articles open access 36 months after publication; a policy which meets the FBA's charitable aims of providing high-quality information on freshwaters to the public. The FBA has gained interest in its proposal of a special issue or volume of *Freshwater Reviews* on the EU Water Framework Directive (WFD) which is proposed for publication in 2016.

*Newsletters*

*FBA News* remains a popular membership benefit and continues to receive rich and varied contributions. 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 from around the world as well as updates on what is happening at the FBA and ways to get involved. We also continue our contract with SIL to produce their bi-annual members' newsletter *SIL News*.

**Training**

Training course income, although reduced from previous years, has made a significant contribution to the incoming resource of the organisation. 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.

*Programmed Courses*

A full schedule of programmed courses was run in 2014/2015, a selection of which included:

- Identifying macroalgae
- Entomology for anglers, Level 1
- Entomology for anglers, Level 2
- Identifying aquatic beetles
- Identifying caddis
- Identifying chironomid larvae
- Sampling and identifying freshwater invertebrates

Few courses in this period had to be cancelled due to insufficient participant uptake, while our 'Entomology for Anglers' courses are still proving very popular with strong demand and forward bookings extending well into 2015/2016. Development of these courses also saw us running our Entomology for Anglers Level 3 course in September 2014 for the first time.

*Bespoke Courses*

A varied list of bespoke courses was also undertaken:

- Six training courses on protected species (Great Crested Newts, Crayfish and Water Voles) for the EA.
- A three-day phytoplankton training course for the EA, held at the FBA River Laboratory, and tutored by the FBA Chief Executive, Bill Brierley, and FBA HRF, Allan Pentecost.
- 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. It was tutored by FBA staff John Davy-Bowker and Simon Pawley, and Stuart Crofts, one of our Entomology for Anglers tutors.

**Continuing Professional Development (CPD)/Accreditation**

*Accreditation*

The second tranche of candidates completed their species-level macroinvertebrate modules and examinations for the EA accreditation scheme. This accreditation scheme was developed for the Agency by the FBA and is currently restricted to EA staff. The scheme is administered and delivered by the FBA and we were pleased to host training sessions at both of our sites. During October the FBA also ran its family-level certification course *Invertebrate identification for biotic assessment (including examination)*. This FBA certification scheme complements the EA in-house accreditation scheme and is open to all candidates who wish to obtain accreditation in species-level macroinvertebrate identification.

The FBA received funding from Scottish Natural Heritage (SNH) to run a four-day pilot course and accreditation scheme for surveyors of aquatic macrophytes. This ran from 29th July to 1st August 2014, and was tutored by Nigel Holmes.

**Teaching**

Provision of teaching to University students is a small but developing area of FBA activity. The FBA is in discussion with the University of Cumbria about FBA involvement in their new BSc course in Aquatic Conservation, which is due to be launched at its re-opened Ambleside campus in 2015. Two one-day freshwater bioassessment undergraduate courses for some 50 Southampton University students were also tutored by John Davy-Bowker in 2014.

Several universities have hired FBA facilities at Windermere and FBA staff to help deliver their courses:

- Bristol University MSc teaching/field trip
- Manchester Metropolitan University Undergraduate Invertebrate identification course
- Manchester Metropolitan University *EGS MSc Field Trip*
- Lancaster University Lake Ecology Masters field course
- Queen Mary University of London (QMUL) Masters Course on ‘Quantitative Techniques for Surveying and Monitoring in Ecology’

The River Laboratory has also continued to provide facilities to a number of Universities for their field courses including:

- Bournemouth University
- Southampton University
- QMUL
- Exeter University

The River Laboratory also welcomed another visit from Oxford University tutors and students as part of their initial MSc course field trip, with John Davy-Bowker providing a presentation on the work of the FBA and tour of the laboratory and experimental facilities.

Many of these institutions were 'returning customers' and we are encouraged by the gradual growth in the number of University departments making a visit to the FBA a regular component of their teaching programme.

**Research and Scientific Contracts**

*Freshwater Pearl Mussel Projects*

The Freshwater Pearl Mussel Ark project continued to produce good results this year despite the challenging financial situation. The project remains a collaborative one between the FBA, Natural England (NE) and the EA.

The number of juvenile cohorts at the Ark is increasing year-on-year as staff continue to gain experience about juvenile requirements and to improve captive rearing practices accordingly. The oldest juveniles are now almost seven years old and little or no mortality is observed at this age. This indicates that the limiting factor in juvenile recruitment is in the very young juveniles (0-4 years old).

In 2014 a bid was submitted to Biffa Award (a landfill tax fund supporting community and environmental projects across the UK) for a 3-year, £1.5 million project focusing 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 bid was successful and as the lead-partner, the FBA will co-ordinate the project from the Windermere site. Project partners include NE, the EA, North York Moors National Park, South Cumbria Rivers Trust (SCRT), West Cumbria Rivers Trust (WCRT) and the Devon Wildlife Trust. Recruitment of a Project Manager (FBA based) and four Project Officer posts (with our project partners) began in March 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.

*Stonefly Studies*

John Davy-Bowker, with help and advice from FBA HRFs Malcolm Elliott and Ian Wallace, and the author of the forthcoming FBA stonefly key, Mike Hammett, conducted some preliminary laboratory work on stonefly rearing to investigate the possibility of conducting complete life cycle rearing of Plecoptera (Stoneflies) in captivity. As is the case with Freshwater Pearl Mussels, Stoneflies also have exacting habitat requirements that make captive breeding challenging, but several members of this order of insects are in decline in the wild and captive breeding may, in the future, provide a means of reversing some of this freshwater biodiversity loss.

*Freshwater Macroinvertebrate Biomonitoring*

Work on the River Invertebrate Prediction and Classification System (RIVPACS) and River Invertebrate Classification Tool (RICT) continued this year. RICT is the standard macroinvertebrate tool used by the EA, Scottish Environment Protection Agency (SEPA), Natural Resources Wales, and the Northern Ireland EA to perform WFD assessments of the biological condition of streams and rivers.

John Davy-Bowker and Ralph Clarke, in collaboration with Iwan Jones and John Murphy of QMUL, did further work on a contract for the Scottish Executive to integrate the biotic indices LIFE (Lotic Index for Flow Evaluation) and PSI (Proportion of Sediment-sensitive Invertebrates) into RICT. John and Ralph also started a new project to develop a standard

test dataset for RICT so that future software upgrades could be tested to ensure that the programme still gave the same answers after any such upgrades. Work was also done to develop a standalone version of the Great Britain RIVPACS model within RICT so that some of the RICT predictions could also be tested against this independent version.

The RIVPACS/RICT test dataset described above 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.

*FBA Laboratory Work*

The FBA continued to assist the Westcountry Rivers Trust in support of their biomonitoring work to improve the quality of headwater streams. The FBA also supplied a small amount of work to Wessex Water to externally audit some samples that had been processed and identified by contractors.

*Other Contracts*

Work continued on a contract with SCRT to deliver pre- and post-project monitoring for river restoration projects on the River Kent system as part of a Cumbria-wide river restoration strategy.

Following the completion of the Algal Bloom Pilot project in 2012/2013, further funding has not been available. We continue to seek additional funding to continue this initiative.

West Dorset District Council again funded the FBA to control populations of the Blandford Fly (*Simulium posticatum*) in the River Stour in 2014. The Blandford Fly's name derives from major outbreaks of people being bitten around the town of Blandford in Dorset in the 1960s and 1970s. Bites from *Simulium posticatum* are a public health problem causing pain, itching and swelling that can require hospital treatment. The problem remains to this day and the FBA have been regularly contracted by West Dorset District Council to undertake targeted control of this species.

*Long Term Monitoring*

With kind help from a number of students and volunteers, John Davy-Bowker continued to collect spring, summer and autumn macroinvertebrate and diatom samples from the Rivers Frome and Piddle in Dorset. The River Laboratory Long Term Monitoring project, now in its eighth year, seeks to better understand the affect of climate change on stream communities through the assembly of high quality dataset linked to temperature and flow records.

*PhD Students and Grant Awardees*

The Association supported six PhD students during the year.

Helen Rosenkranz (University of Bristol), who had previously successfully defended her thesis in 2012, has now completed writing up corrections and is writing this up as research papers.

Fiona Bracken (University of Durham) successfully defended her thesis in 2014.
She submitted a paper to *Molecular Ecology* at the end of 2103, on “Contrasting population genetic structure among freshwater-resident and 1 anadromous lampreys: the role of demographic history, differential dispersal, and 2 anthropogenic barriers to movement”.

Gary Rushworth (University of Leeds) successfully defended his thesis on macroinvertebrate community structure and functional development in reed swamp habitat in 2014.

Felicity Shelley (QMUL) also successfully defended her thesis in 2014 and an article summarising Felicity's PhD was published in the Autumn 2014 edition of *FBA News*, with two research papers also published during the year: Widespread methanotrophic primary production in lowland chalk rivers and Microbial methane cycling in the bed of a chalk river: oxidation has the potential to match methanogenesis enhanced by warming.

Clare Gray (QMUL) entered the third year of her studentship.

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

The 2014 Gilson Le Cren Memorial Award was made to Iliana Bista (Bangor University), for a project on "Understanding the ecological relevance and temporal persistence of community freshwater environmental DNA in a natural lake ecosystem". An interim progress report was published in the autumn/winter 2013/14 issue of FBA News and a final report will be published on the FBA website later in the year.

The Grants & Awards Committee met in January 2015 and agreed to recommend that the Award be offered to Mark Stevenson (University of Nottingham), for his application "Variability in Arctic lake carbon processing during the Holocene along a landscape gradient: Lipid biomarker records from Disko Island, West Greenland'". This recommendation was then formally endorsed by FBA Council.

**Profile Enhancement and Promotion of Science**

*Conferences, Workshops and Events*

In April 2014 John Davy-Bowker contributed to a workshop on Important Freshwater Areas at Oxford Brookes University. In May 2014, Melanie Fletcher gave a talk at the River Restoration Centre (RRC) conference on restoration monitoring in Sheffield. In June 2014 John Davy-Bowker attended the Rivers Trust annual conference in Penrith and in October 2014 John Davy-Bowker attended a Natural Environment Research Centre (NERC) Doctoral Training Programme event at the University of Sheffield. The FBA presented its latest work on the Riverfly Partnership on-line database at a Riverfly conference at the Natural History Museum (NHM) in November 2014. In February 2015 John Davy-Bowker gave a presentation on freshwater biodiversity loss to the Wessex Conservation Forum at Bournemouth University and also attended a NERC Innovation Workshop at the University of Bristol.

*Society Links*

At a national level, FBA links with other societies have also been strengthened with Melanie Fletcher continuing in the role of co-secretary of the Aquatic Ecology Group of the British Ecological Society and John Davy-Bowker serving as Board Member and Steering Group Member for the Riverfly Partnership, a Trustee of the National Biodiversity Network, and a Steering Group Member for the Keeping Rivers Cool project.

*School Visits*

The River Laboratory has hosted a range of education visits for school groups from several local schools including Thomas Hardye School (BTEC year 11 and year 12 groups), Thomas Hardye School gifted children group, and school groups from Blandford School and Lord Wandsworth College. These educational visits are very popular with teachers and children alike and provide an important opportunity for extracurricular enrichment and learning about the importance of freshwaters. These visits are regularly posted on FBA social media.

## Site Development

*Annexe*

At Windermere, development of the Annexe Building into apartments is progressing, and it is anticipated that a contractor will start on-site in January 2016. Contrary to an earlier decision, it has now been agreed that FBA will retain ownership of the whole building.

*Green Energy*

Council approved the investment in a biomass boiler to provide heating and hot water for the Pearsall and Annexe buildings, and also to install Photovoltaic's to supply electricity to the Pearsall Building.

At the River Laboratory work continued to market rentals in the Farmhouse and one of our existing tenants Environmental Scientifics Group (ESG) took up a new laboratory in the main building to re-start their own in-house chemistry services. Another existing tenant, the Game and Wildlife Conservation Trust, took up rental of an additional office, and we were also very pleased to welcome a new tenant Andy Fellows, a freelance IT consultant, who has also taken up a lease for office space in the main building.

## Personnel

*Senior Management*

In early February 2015 we were delighted to welcome Dr Bill Brierley as our new FBA Chief Executive/Director. Bill joined us from the EA and has also previously served as an FBA Trustee and as the Acting Chair of the Association. At the same time John Davy-Bowker reverted to his former role as Facilities and Research Manager after a 19-month period serving as Acting Director.

*Windermere Staff*

In May 2014 we were very pleased to welcome Tamsin Vicary who joined us as our new Collections Manager, working with Ian Pettman (Honorary Information Scientist).

During 2014 Thomas Miles, a Knowledge Transfer partnership student with the University of Cumbria, also joined us as a casual to help develop a number of pieces of work including the new FBA website. We have maintained Tom's services on a contractual basis.

Soraya Alvarez also began a new temporary contract to begin work on documenting historical changes in the River Ehen catchment (a prime UK site for Freshwater Pearl Mussels) funded by United Utilities (UU).

In March 2015 we said goodbye to Dr Karen Rouen (Science and Publications/Knowledge Transfer Manager). We wish Karen well in her new career and thank her for the hard work and dedication to the FBA over her 15 years of service.

During the course of the year Jonathan Freeman and Eloy Benito Reyes, both existing members of staff on temporary contracts, were made permanent.

*River Laboratory Staff*

At the River Laboratory Michelle Stracey joined us part time in August 2014 to work alongside Steph Smith providing 5-day reception and administrative support.

*FBA Fellows and Volunteers*

Across the organisation as a whole 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 Mike Ladle |
| Ken Clarke | 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 |

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 and Elizabeth Warren who have helped tremendously with the cataloguing and photography of the Fritsch Collection. Many thanks also go Susan Jones who coordinated the collection and initial sort of Dr Nigel Holmes' archive of river restoration materials as part of the FBA Unpublished Collections.

# 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 Centre for Ecology and Hydrology (CEH) but now School of Biological and Chemical Sciences, QMUL in an advisory and collaborative role.

Following the initial survey of the South Winterbourne in 2010, severe drought (2011/2012) and exceptional flooding (2012) disrupted the regular annual dry/wet cycle. The drought resulted in dry winterbourne reaches until flow resumption on May 1st 2012. The late wetting resulted in the absence of many winterbourne specific species (*Metacnephia amphora* and *Nemoura lacustris*) and in 2013 most specialist winterbourne taxa were absent. A year of continuous flow was sufficient to change the macroinvertebrate faunal composition to a community typical of perennially flowing reaches and generated large changes in some between-year abundances. These data are now published (Bass and Armitage 2014) but monitoring of the sites is continuing to observe recovery to the 'winterbourne state'.

The investigation of the Sherford River with Jon Bass has now been completed and submitted for publication. The Sherford River arises from small intermittently flowing slightly acidic tributaries but also receives higher conductivity water from a tributary, Morden Stream, north of the river. The Sherford is historically a heavily modified system involving channelization and impoundment; the most obvious feature being the Morden Park Lake. In addition to these physical impacts the stream receives effluent from a Sewage Treatment Works just upstream of the lake. The macroinvertebrate fauna was used to assess environmental quality using the national assessment methodology, RICT. Four sites above the lake were classified as 'moderate' and the 2 sites below the lake as 'good'. Flow instability and river bed substrate in the upper sites are discussed in relation to faunal community together with the role of the lake in buffering extremes of flow and nutrient loads from the STW. This work 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. Further surveys of small streams entering Poole Harbour are planned.

I continue assisting staff from QMUL who are now handling the yearly survey of the Bovington Stream which drains the Ministry of Defence tank training range. The chironomid I found on the Dorset coast has now after DNA sequencing of further material been named *Chaetocladius purbeckensis*. I studied the macroinvertebrate fauna of cress beds for a funded project with Bournemouth University and I am also involved with, the Avon Monitoring Group and Wessex Water in connection with some of my past surveys of small streams which are now of interest to them. I continue to have links with Dorset Wildlife Trust. I have supervised volunteer students here at the River Laboratory and examined a PhD thesis from University of Amsterdam on aquatic invertebrate diversity in agricultural ditches in The Netherlands.

*References* (other than in list of Publications below):
**Armitage, P.D.** (2014). The macroinvertebrate fauna of cress beds. A Report to Dr. G Esteban (Bournemouth University).

**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. Two papers have been produced in the past year, both published in international, peer-reviewed, journals.

The first described the morphology and occurrence of the European medicinal leech *Hirudo medicinalis* (Kutschera & Elliott, 2014). Although the European medicinal leech (*Hirudo medicinalis* L. 1758) is one of the best-known members of the Hirudinea due to its use in phlebotomy, this species has been confused with the Mediterranean taxon *H. verbana* Carena 1820. Here we describe the morphology of adult and juvenile *H. medicinalis* and document its genetic distance to *H. verbana*, using newly acquired mitochondrial DNA-sequence (cytochrome *c* oxidase subunit I, CO-I)-data from specimens collected in Germany. Our CO-I analysis shows that *H. medicinalis* and *H. verbana* differ by 9.4%. Hence, the original *Hirudo* population diverged ca. 10 million years ago so that two geographically separated species exist today. We analyzed the behaviour of adult *H. medicinalis*, but could not find any differences with respect to its sister taxon *H. verbana*. Finally, we summarize the occurrence of *H. medicinalis* in Central Europe and conclude that this once widely distributed freshwater species has largely disappeared in many countries. We suggest that losses of natural freshwater ecosystems, with flat, warm banks, and amphibians (frogs, newts and toads) as preferred host organisms for the juvenile leeches, are largely responsible for the decline of *H. medicinalis* in Northern Europe.

The second paper is the last to be published on the juvenile sea-trout population in Black Brows Beck, and describes density-dependent and density-independent growth in the population, assessed using long-term data (Elliott, 2015). The objectives were to check the validity of a growth model and to examine the relationship between population density and: (i) the overall mean length of the trout; (ii) the difference between each model-estimated mean length and the observed mean lengths for the highest and lowest 10% of measurements in each sample; (iii) the individual variation in trout lengths (measured by Coefficient of Variation: CV%).

First (0+) and second (1+) year-old juvenile sea-trout were sampled by electrofishing at the beginning and end of the summer from 1967 to 2000. The trout left the stream as pre-smolts in May, soon after their second birthday, so that few 2+ trout were taken. Length, rather than mass, was used in this study because all fish were measured but only a sub-sample was weighed. Mean length was not related to population density and, therefore, mean growth was density-independent. A growth model, developed in previous studies, estimated the mean mass of the trout over the two years spent in fresh water. These estimates were converted to mean length, using length-mass regression equations. There was good agreement in most year-classes between the model-estimated value and the observed mean length for all trout taken in each sample. Exceptions were that the mean length of 0+ trout after two summer droughts was lower than expected, although compensatory growth followed, so that observed and expected values were similar for 1+ trout.

Mean lengths for the highest and lowest 10% of measurements in each sample were significantly higher or lower, respectively, than the estimated mean value. The difference between the latter and the higher or lower mean values was related negatively to population density. Therefore, mean lengths of the fastest and slowest growing trout were density-dependent. There was also a negative relationship between population density and the CV% for 0+ and 1+ trout. Therefore, 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.

Finally, I have to report the sad news of the death on the 17 July of Uwe Humpesch, a friend, and co-author of the FBA Scientific Publications on adults and larvae of Ephemeroptera. I have written an obituary for *FBA News.*

*References* (other than in list of Publications below):
**Elliott, J.M.** (2014). Obituary: Uwe H. Humpesch. *FBA News*, **64**, 16.

**D. Glen George**
***Limnology and zooplankton ecology***
In 2014 my studies were again focussed on the impact of climate change on the lakes. These included:

- Continuing support for the EU NETLAKE project
- The collation of historical data on the geographic characteristics of the larger Cumbrian lakes
- An analysis of the effects of short-term changes in the weather on the dynamics of Llyn Tegid in Snowdonia

*The EU 'NETLAKE' Project*
The EU funded NETLAKE project is now in its second year and in 2014 organised a number of workshops in Europe to promote the wider application of automatic monitoring. I am the co-coordinator of the Working Group 'Informing policy and management using lake sensor data' but was, unfortunately, unable to attend the last project meeting held in Turkey in early January. A multi-authored paper on 'Automatic high frequency monitoring for improved lake and reservoir management' is in preparation and will be based on Case Studies collated from by a number of sites in Europe.

*The geographic characteristics of the larger Cumbrian Lakes*
During my time with the FBA and Institute of Freshwater Ecology, I supervised a number projects on the physical characteristics of the large lakes and their surrounding catchments. Most of these results are in scattered reports so need to be collated and re-analysed before they can form the basis of a scientific paper.

*The impact of extreme weather events on the dynamics of Llyn Tegid (Snowdonia)*
The automatic monitoring station deployed on Llyn Tegid was damaged by strong winds in January 2014 but plans are in hand to replace the station with one of the new units now being built by CEH and funded by NERC. The new station will be fitted with a winch to lower an array of sensors through the water column and will greatly enhance our ability to detect features like the first stages of thermal stratification and the development of algal 'blooms'. A draft of a paper on the impact of extreme weather events on the dynamics of Llyn Tegid is currently being revised in the light of new work on the Atlantic Jet Stream published in 2014.

**Terry Gledhill**
***Invertebrate Taxonomy***
Some progress has been made on the 'Revised check-list of the water mites of Britain and Ireland'. However, this cannot be completed until the final (third) volume of the collaborative work on the keys to the water mite species of central and north-western Europe (Davids *et al* 2007, Di Sabatino *et al* 2000) is published. This final volume deals with the species-rich superfamilies Lebertioidea and Arrenuroidea. Most of my time has been spent checking and revising the manuscripts and figures for this last volume and I am pleased to report that all are now with our co-author and editor, Dr Reinhard Gerecke, University of Tűbingen. I thank Council for the support given over the many years that this project has taken.

I have refereed papers and given advice to colleagues on taxonomic matters and identification of freshwater invertebrates. As to future work, I hope to continue my studies on water mites and subterranean crustaceans.

*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***
We continue to add to the Fritsch Collection thanks to the voluntary help of Brenda Leese and are very glad to receive papers, sometimes in exchange for digitizing algal sheets when requested. Most of our correspondence now comes by email and include publication alerts.

I continue to respond to visits and various requests for information from UK and overseas. We are particularly encouraged by a young correspondent from northern Scotland, inspired by Alan Joyce to study desmids and currently we have an artist seeking inspiration from algal structures and planning an exhibition at Wray Castle, the first home of FBA.

Following the Conference of the Society for the Preservation Natural History Collections at Cardiff, in June 2014, I am adopting the 'Crowd Sourcing' approach to aid the digitizing of the Fritsch Collection of Algal Illustrations. I put a request in a local paper for volunteers to help with preparing the species list: Elizabeth Warren began work on the Chrysophyte species checklist and Anna Callaghan to work on Charophytes; I continue work on the desmid database. The species names of the Charophytes, a very early group (Linneaus 1753), have been particularly hard to check. Mrs Warren has now moved away, having dealt with 388 genera and species in the 3 months she was here. Over 1000 sheets have been checked in the six months, recording where we have copies of original figures and diagnoses, sorting the various errors in dates and authorities, or repairing problems such as loosened items. This has required our essential use of the FBA library as well as online cross-checks with species names in 'Index Nominum Algarum' and 'AlgaeBase'. We do find names in our library documents that are not included in either lists. Links to the European Biological and Horticutural Libraries (EBHL) also enabled us to restore missing plates to a paper in the library once belonging to Professor F.E. Fritsch.

We have had advice on photography from Kendal Museum which has improved our digitization techniques and plan to increase this side of our project as the database allows. In doing much of the work as volunteers we hope that we may need only find the funding for a suitable website that can be continually updated. It is really essential that the Collection can be widely accessible online to researchers worldwide as much published material has dropped out of sight; a reason why the FBA library is such an important resource.

The death of John Lund (March 2015) is very significant to the Fritsch Collection. It was passed into his keeping on the death of Professor Fritsch and he has been responsible for its considerable enhancement over some 50 years, whilst on FBA staff and long into his retirement. As his 'understudy' and successor I know how much staff of '*The Fritsch'* have benefitted from his wisdom and how much we miss him.

**Alan Hildrew**
***Ecology of Streams and Rivers***
I have been Editor of *Freshwater Biology* since 1982, but I will finally be retiring from this role in 2015, taking new manuscripts up to the end of March and handling existing ones through to the end of June. Since *Freshwater Biology* receives a total of around 700 papers per year, of which I handle around 250, this will be a major change. It will be strange not to be continually editing other people's papers, but I am now looking forward to the freedom this will give me. In particular, I have been working on the book I have to write as part of the International Ecology Institute (IEI) prize (awarded in 2012), and have made progress in

2014. However, I am determined to finish it in 2015, and the extra time available in the second half of this year is my opportunity to do so. I also plan a book on stream ecology when the IEI book is finished, so my hands will continue to be full.

I continue to play a part in the UK's Uplands Waters Monitoring Network, being responsible for the macroinvertebrate monitoring. Despite cuts in funding from Defra, we will complete the invertebrate sampling for 2015 – although beyond that the programme remains in question. I have continued to progress a reassessment of the longitudinal distribution of hydropsychid (caddis) larvae in the Rivers Usk and the Loire (jointly with Bernhard Statzner), in both cases using archived information from earlier years. We have now modelled temperature change in reaches of both rivers over several decades. I gave a paper on this topic at the recent joint meeting the British and French Ecological societies in Lille before Christmas and drafting a paper is in hand. I am also working on papers around the topic of recovery of communities from acidification, and on why this may be delayed due to biotic interactions. I gave a paper on this latter topic at the joint meeting of the Association for the Sciencies of Limnology and Oceanography (ASLO) and the Society for Freshwater Science (SFS) (formerly North American Benthological Society (NABS)) in Portland, Oregon in June 2014.

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 act as a Research Excellence Framework advisor for a number of University departments and as a scientific reviewer for the Spanish Government.

I represent FBA on the European Federation for Freshwater Sciences (EFFS) and serve on the scientific committee for the next SEFS (Symposium for European Freshwater Sciences: a series of meetings founded by FBA) in Geneva this summer. I am also a judge for the EFFS prize for the best European PhD thesis, the winner of which will give a keynote paper at the Geneva meeting. I hope FBA will continue to play a leading role in EFFS/SEFS, since it is our main international 'face', and a forum where we can make a difference.

**Mike Ladle**
***Ecology of Fish***
In 2014 Dr Stewart Welton and I were again contracted by the FBA (funded by the North Dorset District Council) to control the Blandford Fly. The reduced monitoring of recent years continued and seems to be adequate. The effective *Bti* formulation of **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. Despite the current financial problems of local councils it appears that treatment is likely to go ahead in 2015. I think that this is in no small measure due to a recent petition raised by a Blandford resident which received about 2500 signatures.

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

I have continued as advisor to the River Allen Association.

The run of salmon on the Frome in 2014 was the lowest recorded (FBA Counter figures) but catches were good with 16 Salmon and 52 seatrout reported by anglers. All salmon and many seatrout were again returned alive. The good catch was due to the fact that fishing conditions were excellent and following the previous winter's high water levels weed growth was poor.

I am 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. Last season there were potential problems with fishery access at East Stoke but this was equitably resolved with the help of the FBA management. A new and very satisfactory arrangement has been set up for 2015.

The one usable bridge at West Holme still needs new steps at the south end, if access to the north bank fishing is to be sustained and I believe that this matter is now in hand. The 2015 fishing at West Holme is almost fully booked for this season so the income should be almost at a maximum this year. I believe that the heightened interest is due to the fact that I have encouraged the anglers to fish for seatrout in recent years.

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***
It has been a busy year with plenty of research activity. A substantial database related to lake sediment phosphorus has been prepared and material continues to be added. This will be used eventually to compare lake sediments in Cumbria and increase our understanding of phosphorus sediment-water interactions. Two papers have been published, one of them completing an investigation of *Vaucheria* calcification and comparing it with calcification processes in other algae. This work, together with that on the Devoke Water littoral algae was undertaken in Cumbria. Advantage was taken of the good summer of 2014 to investigate in detail the rocky littoral of Devoke water, which contains an abundance of incrusting cyanobacteria. Detailed transects were taken and the data analysed using an ordination technique. Devoke water was shown to possess elements of both an alpine and lowland rocky flora, in keeping with its location. It also demonstrated a stable community structure around the entire margin of the waterbody, which will be important as it will be used to prepare a future sampling strategy for other Lake District tarns and lakes.

Other work undertaken this year includes preparation of a Cumbrian freshwater algal flora to be published by the FBA. The flora will be prepared in two volumes, the first containing all non-diatom algae. The region is so rich in algae, and has received so much attention, that division into diatom and non-diatom algae appeared appropriate. The first volume is progressing well and should be ready for publication at the end of the year. Another paper on the true shape of ellipsoidal algae is well advanced and Chris Carter has provided me with some excellent images of *Spirogyra* zygospores for analysis. This work should be written up and submitted within the first part of this year. Other work includes a hydrochemical survey of the Arnside-Silverdale Areas of Outstanding Natural Beauty with my colleague Peter Standing for a presentation in May and a short write-up, and my continued joint work with a Czech group on molecular analyses of members of the Chroococcales (Cyanobacteria).

Two articles are in press, both written this year- one in the Alpine Journal on slippery algae of the mountains and the other on the algal flora of a remote north Wales lake.

I have represented the FBA at a number of meetings including one organised by UU and another involving the monitoring of the recently flooded Foulshaw Moss, and attended a number of other scientific meetings. I have also prepared and run a phytoplankton course for an independent consultancy. No doubt the following year will keep me well away from the armchair!

**Ian Pettman**
***Data and Information Retrieval***
The two main aims of this fellowship are 1) to be available to the DIS staff for consultation and mentoring and 2) to undertake research, development and contracts on information retrieval tools and systems for the aquatic sciences.

The priority for the 2014/2015 period has remained the assistance with the preparation of funding bids and participation in the contract work in order to consolidate the DIS' contributions to the future of the Association.

*Information Manager moves on*
I had the pleasure of mentoring Hardy Schwamm (FBA Collections Manager) for nearly six years. During that time, Hardy's skills developed tremendously and he was consistently successful in both contributing to and winning a wide range of revenue generating contracts as well as expanding the customer base. His success and the breadth and depth of his skills lead to Lancaster University creating a post for him and he reluctantly left the FBA on 7 March 2014.

*Appointment of, and induction work with, the new Collections Manager*
I was involved in the recruiting, interviewing and appointing of Hardy's replacement.

The highlight of this 2014/2015 reporting period has been the arrival of Tamsin Vicary as the new Collections Manager. Tamsin started on 19 May 2014 and immediately demonstrated her abilities in delivering contracts and negotiating new ones. Tamsin is a very able professional and is rewarding to work with. She is keen to develop the DIS range of services together with the rest of the team and to further enhance her skills for the future.

*HLF Oral History Project "Clear Waters"* http://www.clearwaters.org.uk/
I transcribed six of the interviews recorded during this project as well as doing some editing work on existing transcriptions. Full versions of the Clear Waters interviews that include information on Windermere are available, from http://www.amblesideonline.co.uk/aohg/register.html *(Registration is required, but is free of charge).*

*EA Grey Literature Project*
I assisted Tamsin in adding subject, geographic and taxonomic keywords from the FBA vocabularies to the 3,500 EA grey literature documents. These are now available as open access digital documents. http://ea-lit.freshwaterlife.org/.

*ASFA Grey Literature Contract*
Tamsin negotiated an ASFA Trust Fund contract and work started at the end of August 2014. The result will be 1150 grey literature documents indexed in ASFA and linked to the full text digital open source versions. I am working with Tamsin to ensure that this is completed on time for the end of May 2015.

*ASFA Secretariat Contract*
Tamsin also negotiated a contract with the ASFA Secretariat to make recommendations on the future field structure and display of the ASFA records and on the implications of widening the subject coverage and including records and links to data sets. The possible new subject areas to be examined include groundwater, water as a resource for industry and agriculture, and public water supply. The recommendations will take into account any implications for the record fields, the existing ASFA tools and ProQuest platform. I am mentoring and assisting Tamsin with this work.

*DTC Vocabulary and AEDA Testing*
Tamsin and I have worked together on expanding the vocabularies used in the DTC project – particularly on the terms arising from the column headings in the various catchment and other data sets being submitted to the data archive. We have also done some testing of the functionality of the software for the FBA linked data repository, now called AEDA.

*Other Projects*
During this reporting period I have also done some further work relating to:
- ASFA Geographic Index Strings
- ASFA Regular input (books and journals)
- Cross Walk work relating to three EA databases

*Mentoring*
Consultation and mentoring for DIS staff encompassed the following:

- Continued assistance with regular enquiries for library, unpublished documents, data and samples
- Attendance at Data and Information Services Advisory Group meetings
- Advice on the application of standards to the digital repository
- Assistance with presentation on Data Archives which Tamsin successfully gave at the UN ASFA Board Meeting in Beijing – the Intergovernmental Oceanography Commission uploaded a video of the presentation to the internet immediately after.
- Mentoring and advice relating to the AST ProjectMentoring and advice relating to Tamsin's negotiations for the FBA taking on the role of the UK National Centre for ASFA. This role was previously held by the National Marine Biology Library, Plymouth.

*Representing FBA*
I acted as the Chair of the Food and Agriculture Organization of the United Nations Board Meeting, Beijing for the 5 days of 13 – 18 October 2014.

**Paul Raven**
***River Ecology and Morphology***
The main highlight of the year was publication in August of 'Rivers', the third volume in the *British Wildlife Collection Series*. Little more than six weeks later, the sudden and untimely death of Nigel Holmes - who had asked me to write the book with him - came as a great shock to everyone who knew him for his boundless energy, encyclopaedic knowledge of rivers, and infectious enthusiasm. Attention inevitably turned to securing Nigel's legacy and in particular archiving the records of river plants meticulously recorded along so many reaches of river across the UK and stretching back to the mid-1970s.

I carried out a preliminary inventory of potential archive material and presented results in late January to a special meeting of the Freshwater Habitat Advisory Group that I'd arranged several months beforehand. The main themes of the meeting were (i) securing the Nigel Holmes legacy, (ii) assessing the current capacity of 'river' expertise in the UK (using the FBA's December 2005 report '*A Review of Freshwater Ecology in the UK*' as a baseline to assess trends and prospects), (iii) transforming information into knowledge and practical action (something Nigel was very skilled at doing) ,and (iv) finding better ways of explaining how rivers behave-most notably by using hydrological, morphological and ecological monitoring to assess ecosystem functioning, dispelling popular misconceptions, and replacing out-dated educational resources for teachers and children.

Bill Brierley was present in his capacity as incoming Chief Executive/Director of the FBA and this proved extremely useful in relation to the FBA's interest in archiving and making accessible the river plant records. Discussions on a continuing decline in career opportunities for freshwater ecology, loss of knowledge as the 1970s generation of outstanding freshwater ecologists retire or pass on, and the low profile of freshwater ecology at Government level were all germane to the FBA's future leadership role in the subject. With this in mind, making the most of the collective experience and wisdom of HRFs seems to be even more important for the FBA, and I look forward to contributing.

In July, Peter Scarlett (CEH) and I provided tuition for the 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. One of the many benefits is sharing and comparing database information on river habitats and river plants (another Nigel Holmes legacy).

As a British Ecological Society (BES) Council Member, I continue to promote wherever possible the work of the FBA member at meetings and conferences, and consider that closer working links between the BES and FBA would benefit both learned societies.

**Colin S. Reynolds**
***Ecology of Phytoplankton***
This year, I have maintained at least a modest level of activity for the FBA and freshwater science generally. The paper with Dr Alex Elliott and Marieke Frassl, mentioned in my last report, has graduated to the status of a full published paper now (see listed publications) and has attracted some interest. A paper I wrote last winter, in response to an invitation allegedly dispensed to all past winners of the Ecology Institute Prize has also been submitted and published; despite a very exciting trailer on *Google*, I am unaware of ANY interest that it may have stirred! My most pleasant task has been to write a foreword to a publication on the freshwater phytoplankton of Argentina; to do so took me back to a course I taught at the University of Buenos Aires in 1995 because it was attended by nearly half the present chapter authors attended. It is most gratifying to recognize in these very elegant works, a "return" on the intellectual investment!

I have also been involved in another "blast from the past", this time to do with EFFS, the international organisation that I began with Alan Hildrew and Roger Sweeting. In discussion with Luigi Naselli-Flores, the present convenor of EFFS, I was able to give some historical background and some diplomatic recommendations about an unfortunate and seemingly difficult upset concerning the original registration of one of the supposedly federated national societies. I am pleased to say that, ultimately, all was satisfactorily resolved!

I have continued to act as Editor for *Freshwater Reviews*. There remains a dearth of good submissions – but we have been able to draw out some very nice contributions consistent with the quality we have established. Once again, we have been well-supported by John Davy-Bowker, Karen Rouen, Rosalind Maberly and several of our Board members. I am very pleased to say how much I appreciate the skills and professional instincts of Louise Lavictoire in the presentation and production of each paper and each volume.

**Roger Sweeting**
***Water Quality and Fish Biology***
This is my eighth year as an HRF. The Freshwater Pearl Mussel Ark Project continues to be my major area of interest. During 2014/2015 the nine different English populations at FBA's Windermere hatchery were reduced to seven: the population of adult pearl mussels from one of the rivers succumbed to an infection, the aetiology of which we do not know. The other population that was lost to the Ark was transported back to the parent river in Devon: we understand that the adults have not survived in the wild.

Our main aim is to maintain these populations and to produce viable offspring which we will grow on until the restoration of their parent river catchments is sufficient to enable them to be restocked. In 2014 over 85,000 juveniles were collected from the fish hosts from five of the mussel populations. Our oldest and largest juveniles produced so far are now eight years old (since release from the host fish) and some are over 30 mm in length (this is significant progress in animals that can reach 17cm in perhaps 150 years).

There have been large mortalities in the juveniles and some in the adults over the years of the project and in the autumn of 2013 we determined to change our cleaning programme for the juveniles and monitor more carefully the water flows. These actions together with other changes seem to have been successful in raising the survival rate in the first year - I will report on this again next year when the metamorphosis to adult form takes place (in the two year old juveniles).

There are three people involved in the Pearl Mussel Project besides myself: Louise Lavictoire (who returned from maternity leave in August last year), Eloy Benito Reyes as Hatchery Manager and Matt Freeman in practical support.

We produce annual reports for our partners and sponsors, NE and the EA - if you wish to see these please contact us.

In 2014, with support from NE, FBA applied for a Biffa award to improve the quality of water in several rivers in England to enable us to reintroduce our juvenile mussels back into the natural environment. FBA will lead a consortium consisting of SCRT, WCRT, North York Moors National Park Authority and the Devon Wildlife Trust over the next three years to achieve this goal in five rivers. We will be appointing a project manager to run this £1.5M project. The success of this project depends on our continuing success in rearing the pearl mussels and the improvements in the designated rivers by our partners. As with any Biffa award we have collectively had to raise 10% of the funding from external sources and I can report that we have achieved this for the first year and for some partners for the second and third years of the project. Several external organisations have contributed generously to this and we will be publicising this when the appointment of the manager is announced. FBA has some hard work to do from an administrative point of view but also from an applied research requirement.

Over the last year Soraya Alvarez and I have been working on an investigation into the history of the River Ehen and Ennerdale which contain the largest population of pearl mussels in England. This contract for UU which will be completed in this financial year has produced some most interesting insights into a catchment that is considered to be one of the most natural in the country-it will provide a report on the historic influences and the consequences of human changes in a Lake District environment over the last two hundred years.

This year I have again carried out health examinations on freshwater fish with assistance from Eloy under Section 30 of the Salmon and Freshwater Fisheries Act (1975) which are used by the EA to assess suitability for transfer to other waters. This has been done on a commercial basis and provides a small income to support our work at FBA.

In September 2014 FBA completed a local environment historic reference project for SCRT as part of the background information that was needed to assess environmental issues within South Cumbria for the Catchment Based Assessment (CaBA) that all the catchment hosts are involved in from Defra via the EA. This piece of work was carried out by Irene Paredes after she finished her swan mussel project, Soraya Alvarez and I. The reference list produced as part of this will be updated formally on an annual basis.

Locally I continue as Chair of SCRT. I also continue my work in the development of standard methods for BSi and the Comité Européen de Normalisation (CEN) particularly with reference to the Water Framework and Habitats Directives and with the development of a standard for assessing the environmental suitability of rivers for pearl mussels. After considerable discussions many of the standards produced in CEN over the last ten years have been incorporated into annex V of the WFD through an amending directive. This achievement has been made possible by cooperation between representatives from many of European government agencies, universities and the FBA.

With FBA's new Chief Executive/Director now in post my efforts over the next period will be more strategic than formerly: I look forward to this challenging landscape.

**Ian Wallace**

***Taxonomy and Distribution of Trichoptera***

The UK Trichoptera Recording Scheme of the Biological Records Centre for which I am the honorary co-ordinator continues to assemble records from a wide range of sources. The recent acquisition of a large data set from the EA and Natural Resources Wales takes the total holdings to over 0.5 million entries. The data will be used to update the maps on the National Biodiversity Network 'Gateway' web-site. Whilst many species would still be regarded as under-recorded, the maps for the commoner species show large areas of the country with blanket coverage. However, there is always a lot of potential amongst amateurs and I was pleased to be able to address a regional conference on 'Under-recorded Insect Groups' organised by the Bedfordshire Naturalists. I also gave a short presentation at a meeting for freshwater recorders held at the Natural History Museum organised by the Biological Records Centre.

The data set has enabled completion of the “Review of Nationally Scarce and Threatened Trichoptera of the UK”, now in press.

Analysing the data set also helps pin-point possible problems with the identification keys as evidenced by several records of rare and local species from unlikely areas of the country. Most lie within the FBA ‘Caseless’ caddis larva key whose up-dating continues to be a major project. Only a few species still require collecting as early instar larvae.

A new caddis to the UK (*Triaenodes ochreellus* McLachlan) was found amongst material sent to the recording scheme for identification. It is hoped to complete an identification note for larvae and adults.

Providing training in identification continues to be an area where I support the FBA. I led a course at Windermere in June. There are exciting possibilities in the production of bespoke site specific keys for use by groups such as riverfly monitoring teams. I attended a meeting about this in Salisbury and also the Riverfly Monitoring Scheme conference held at the NHM. I am on the steering committee of the Riverfly Monitoring Scheme. To help the FBA develop its training opportunities I attend some meetings of the Training Working Group.

The recent flooding of the offices enabled me to advise on the rescue of some insect specimens. Perversely this problem provides an opportunity to look at improving the storage and use of the collections and I am exploring options with staff.

Last February a group of NHM curators visited the FBA. I attended to promote the FBA and also explore joint projects. I will be continuing to explore options along those lines.

**Publications by FBA Staff and Honorary Research Fellows**


Esteban, G., **Armitage, P.D**., Tapia, G., Jofre, G., Olmo, J.L., and Killen, A. (2013). Aquatic biodiversity survey at the Environment Agency's Habitat Restoration Plan site at East Stoke (Wareham, Dorset). A Report to the Environment Agency pp39.

Bass, J.A.B., **Armitage, P.D**., & Pretty, J.L. (2014). Severe drought and exceptional summer flooding: consequences for the South Winterborne macroinvertebrates. *Proceedings of the Dorset Natural History and Archaeological Society* **135**:165-166.

Pretty, J.L, Murphy, J.F., Jones, J.I., Arnold, A., Duerdoth, C.P. & **Armitage, P.D.** (2015). *Macroinvertebrate surveys of the Bovington Stream and River Frome*. Report Commissioned by Debut Services (South West) Ltd on behalf of the Ministry of Defence.

Langton, P.H. & **Armitage. P.D.** (in press). *Chaetocladius purbeckensis* sp. nov.: "*Chaetocladius* sp. Dorset" (Diptera, Chironomidae) Langton and Armitage (2010) named. *Dipterists Digest.*

**Armitage, P.D.** Bass JAB & Hawczak A (in press). The environmental quality of the Sherford River (Dorset) assessed with macroinvertebrate data. *Proceedings of the Dorset Natural History and Archaeological Society*

Kutschera, U. & **Elliott, J.M.** (2014). The European medicinal leech *Hirudo medicinalis* L.: Morphology and occurrence of an endangered species. *Zoosystematics & Evolution*, **91**, 271-280.

**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.

Pentecost, A., Coletta, P. & **Haworth, E. Y.** (2013). Recent changes in the Holocene diatom flora of a karstic lake: Malham Tarn, North Yorkshire, UK. Cave & Karst Science **40**, 2 56-61.

Moorhouse, H.L., McGowan, S., Jones, M.D., Brayshaw, S., Barker, P**., Haworth, E.Y. & Leavitt, P.R.** (2014). Contrasting effects of nutrients and climate on algal communities in two lakes in the century Windermere catchment, English Lake District, since the late 19th century. Freshwater Biology **59** (12), 2605-20.

Stockdale, A., Tipping, E., Fjellheim, A., Garmo, Ø, A., **Hildrew, A.G**., Lofts, S., Monteith, D.T., Ormerod, S.J. & Shilland, E.M. (2014). Recovery of macroinvertebrate species richness in acidified upland waters assessed with a field toxicity model. *Ecological Indicators*, **37**, 341-350.

Lauridsen, R.B., Edwards, F.K., Cross, W.F., Woodward, G., **Hildrew, A.G**. & Jones, J. I. (2014). Consequences of inferring diet from feeding guilds when estimating and interpreting consumer-resource stoichiometry. *Freshwater Biology*, **59**, 1497-1508.

Murphy, J.F., Winterbottom, J.H., Orton, S., Simpson, G.L., Shilland, E. M. & **Hildrew, A.G**. (2014). Evidence of recovery from acidification in the macroinvertebrate assemblages of UK fresh waters: a 20-year time series. *Ecological Indicators,* **37**, 330-340.

Welton, J.S. & **Ladle, M**. (2014). An experimental treatment of *Simulium posticatum* with *Bti* at selected sites on the River Stour, Dorset. *Report to North Dorset District Council*, 10pp.

**Pentecost, A.**, Merritt, R. & Carter, C. (2014). Growth and calcification of *Vaucheria* (Xanthophyta) on a travertine surface in a temperate freshwater setting. Eur. J. Phycol. **49**: 515-525.

**Pentecost, A**. (2014). Distribution and ecology of cyanobacteria in the rock littoral of an English Lake District water body, Devoke Water. Life 4: 1026-1037.

**Reynolds, C.S.** (2014). On the planetary capacity to sustain human populations. *Ethics in Science and environmental Politics*, **14**, 33-41.

**Reynolds, C.S.** (2014). Foreword. In Tell, G., Izaguirre, I. and O'Farrell, I., (eds), *Freshwater Phytoplankton of Argentina*. *Advances in Limnology*, **65**, 1-2.

**Reynolds, C.S.**, Elliott, J.A. & Frassl, M.A. (2014). Predictive utility of trait-separated phytoplankton groups: a robust approach to modelling population dynamics. *Journal of great Lakes Research*, **40** (Supplement 3), 143-150.

# THE FRESHWATER BIOLOGICAL ASSOCIATION
# (A COMPANY LIMITED BY GUARANTEE)
# TRUSTEES' REPORT FOR THE YEAR ENDED 31ST MARCH 2015

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 2015.

The financial statements have been prepared in accordance with the current Financial Reporting Standards in use and The Statement of Recommended Practice (revised 2005) for Charities (the SORP). The Accounting Standards Board recognises the SORP as being in line with its Code of Practice and the Freshwater Biological Association agrees to follow these principles.

**Trustees**
The Trustees of the Freshwater Biological Association during the period 1st April 2014 to 31st March 2015 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 Director. 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 Director, Finance Manager and Business Manager. 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 Director is also reviewed by the Council of Trustees.

# THE FRESHWATER BIOLOGICAL ASSOCIATION
# TRUSTEES' REPORT FOR THE YEAR ENDED 31ST MARCH 2015
# (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 year has been one of change and development in order to prepare the organisation for the challenges ahead. This has included the development of a new business plan, staff review and governance review, and has also identified potential capital projects to ensure the organisation has a sustainable financial future.

The operating deficit before net gain on investments increased from £160,659 in 2014 to £344,261 in 2015, funded by the withdrawal of £300,000 from the Investec investment portfolio. The primary reason was a significant decrease in income of nearly £194,000, from £884,827 in the prior year to £691,179 for the year. This decrease in income was in part due to certain major Scientific and Data projects coming to an end during the year, for example the Defra funded Demonstration Test Catchment Archive Project. Immediately prior to the end of the financial year, however, a £1.46 million 3 year project was awarded by Biffa Waste after a lengthy bid process, and work had just commenced in March 2015. This project is being led by the FBA and involves 5 partners in England with the FBA receiving just over £300k over this period.

Total expenditure during the year decreased slightly, in spite of the cost of consultants who were brought in to oversee the governance review, the organisational review, and the development of the new business plan and business opportunities. These professional fees were anticipated, and added around £70,000 to expenditure.

There was a decrease in rental income, due to a major tenant vacating the River Laboratory at East Stoke. We are actively seeking new tenants for the site. A small amount of rental and facilities income (£15,872) was generated from the Windermere site. The Windermere Ferry income decreased slightly compared to the previous year, due to the ferry being out of service for several weeks for a scheduled 5-yearly refit.

Total incoming resource from charitable activities also significantly reduced year on year, as did the associated expenditure. There was a small reduction in Membership numbers during the year and Membership income decreased slightly from £26,492 to £25,080. Publications income was down, as there were no new Scientific Publications published during the year.

The Freshwater Pearl Mussel Project continued to provide the largest single source of income within Science and Research, with further income generated by projects for United Utilities, and smaller projects for South Cumbria Rivers Trust, and Wessex Water.

As referred to above, income from Data and Information Systems was down as major projects were completed in the year. Other projects included EA Fisheries Archives, ASFA, CaBA Data Standards, and Lancaster University CaBA, the combined income of which was around £68,000.

Income from training courses and meetings remained steady at £64,909 for the year, with expenditure down by some £10,000, a significant improvement on 2014.

There was a significant increase in expenditure on governance, attributable to the engagement of consultants in assisting with the changes to the organisation, including advising on potential capital projects. This was offset to some extent by an existing member of staff taking on the role of Acting Director for the majority of the financial year, following the departure of the former Director in early 2013.

# THE FRESHWATER BIOLOGICAL ASSOCIATION
# TRUSTEES' REPORT FOR THE YEAR ENDED 31ST MARCH 2015
# (Continued)

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 largest element of the Association's investments (39% by value at 31st March 2015) is managed by M&G and is considered by the Trustees to be satisfactorily managed. The Investment Policy was reviewed by the Trustees in March 2009 and no changes were made.

**Plans for Future Periods**
The review of governance, development of a new business model and plan and the organisational review and restructuring started in earnest during the year with the Acting Chair and Acting Director working closely together alongside staff, HRFs and Trustees. Three Council sub-groups were set up to oversee the staff review, estates development and the review of governance. A new Chair was elected to Council in October 2014. The Chair stood down in December 2014 and was subsequently appointed Chief Executive. An Acting Chair was appointed (from December 2014). Several successful workshops involving, staff, trustees and HRFs were used to help develop the new business plan. Council adopted a new "invest to save" approach during the year to provide the organisation the capacity and capability to build a sustainable business model for the future. The draft business plan was finalised and approved by Council in March 2015 together with the recommendation for a new organisational structure. The use of reserves to develop our estate to generate income and meet our charitable objects has been approved and will commence in 2015/16. This will involve primarily the development of the currently unoccupied Annexe building at Windermere into holiday lets, along with investment in green energy for the Windermere site.

The new business plan will be finalised in 2015 and signed off by Trustees in early 2016 following further consultation and development with staff, HRFs and trustees. The outcome of the staff review and recommendations for changes to staff structure will be consulted upon with staff early in the new financial year and it is planned to implement the final structure by Summer 2015. The delivery of the draft business plan will begin as soon as possible after these changes are made and once all posts are filled. The review of governance started last year will be completed following consultation with all members on the revised Memorandum of Articles. These new articles, once signed off by Council, will need to be approved in outline by the Charity Commission and adopted by a special resolution of all members. It is also envisaged that building work on the annexe will start in the second half of the year and the green energy installation will be completed by the autumn.

**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 was approved by the Council of Trustees, and is reviewed annually by the Council of Trustees as part of its governance arrangements.

**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 2015
# (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

Chair of Council
Dr S. Brierley (co-opted to December 2014)
Mr G.R. Bateman, OBE (co-opted from December 2014)

Honorary Treasurer
Mr P.M. Andrewes

Representative Members

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

Elected Members

Ms F. Bowles (co-opted from October 2014)
Dr L. Brown (to October 2014)
Dr A. Crowden
Dr E. Dollar
Dr I.G. Dunn (co-opted from October 2014)
Prof. S.J. Hawkins
Dr P. Shaw

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 21 August 2015
By Order of the Council

Mr G.R. Bateman, OBE
Acting Chair of Council

# THE FRESHWATER BIOLOGICAL ASSOCIATION
# STATEMENT OF FINANCIAL ACTIVITIES
# (INCLUDING INCOME AND EXPENDITURE ACCOUNT)
# FOR THE YEAR ENDED 31ST MARCH 2015

| **Incoming Resources** | | Unrestricted Funds | | Total | Total |
|---|---|---|---|---|---|
| **Incoming resources from generated funds** | **Note** | General £ | Other £ | 2015 £ | 2014 £ |
| Voluntary income: | | | | | |
| Awards and donations | 4 | 4,121 | - | 4,121 | 1,288 |
| Activities for generating funds | 5 | 200,527 | - | 200,527 | 238,196 |
| Investment income & bank interest | 6 | 55,661 | 2,568 | 58,229 | 62,502 |
| | | 260,309 | 2,568 | 262,877 | 301,986 |
| **Incoming resources from charitable activities:** | 7 | | | | |
| Membership services | | 25,080 | - | 25,080 | 26,942 |
| Scientific publications and journals | | 65,297 | - | 65,297 | 87,166 |
| Scientific research & activity | | 100,112 | - | 100,112 | 168,392 |
| FBA Library/Data & Information Services | | 172,904 | - | 172,904 | 235,873 |
| Training courses & meetings | | 64,909 | - | 64,909 | 64,468 |
| | | 428,302 | - | 428,302 | 582,841 |
| **Total incoming resources** | | **688,611** | **2,568** | **691,179** | **884,827** |
| **Resources expended** | | | | | |
| Cost of generating funds | 8 | 180,526 | - | 180,526 | 179,040 |
| Costs of charitable activities: | 9 | | | | |
| Membership services | | 38,615 | - | 38,615 | 31,248 |
| Scientific publications and journals | | 85,602 | - | 85,602 | 85,189 |
| Scientific research & activity | | 236,781 | 4,974 | 241,755 | 317,247 |
| FBA library/Data & Information Services | | 264,590 | 148 | 264,738 | 275,390 |
| Training courses and meetings | | 78,659 | - | 78,659 | 89,157 |
| Governance costs | 10 | 145,545 | - | 145,545 | 68,215 |
| **Total resources expended** | | **1,030,318** | **5,122** | **1,035,440** | **1,045,486** |
| Net (expenditure) for the year before transfers and other recognised gains/(losses) | | (341,707) | (2,554) | (344,261) | (160,659) |
| Transfer between funds | 17 | (125) | 125 | - | - |
| Net gain/(loss) on investments | 13b | 153,692 | 42,598 | 196,290 | 267,095 |
| Gain on the revaluation of Tangible Assets | 18 | 119,020 | - | 119,020 | - |
| **Net movement of funds in year** | | **(69,120)** | **40,169** | **(28,951)** | **106,436** |
| **Reconciliation of funds** | | | | | |
| Total funds brought forward 2014 | | 2,573,661 | 2,591,778 | 5,165,439 | 5,059,003 |
| Total funds carried forward 2015 | | 2,504,541 | 2,631,947 | 5,136,488 | 5,165,439 |

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 gain on investments of £196,290 (2014: total net gain of £267,095) includes realised losses of £102,780 (2014: realised losses of £42,955) attributable wholly to the General Fund Account.

# THE FRESHWATER BIOLOGICAL ASSOCIATION
## BALANCE SHEET AS AT 31ST MARCH 2015
## COMPANY NUMBER 263162

| | Note | 2015 | | 2014 |
|---|---|---|---|---|
| | | £ | £ | £ |
| **Fixed Assets** | | | | |
| Tangible | 13a | | 2,005,187 | 1,893,985 |
| Investments | 13b | | 3,111,694 | 3,215,407 |
| | | | 5,116,881 | 5,109,392 |
| **Current Assets** | | | | |
| Debtors and Prepayments | 14 | 128,298 | | 177,295 |
| Cash at Bank and in Hand | | 85,335 | | 71,381 |
| | | 213,633 | | 248,676 |
| **Less Current Liabilities** | | | | |
| Creditors (due within 1 year) | 15 | (194,026) | | (192,629) |
| **Net Current Assets** | | | 19,607 | 56,047 |
| **Total Assets Less Current Liabilities** | | | £ 5,136,488 | £ 5,165,439 |
| **Representing Members' Funds** | | | | |
| **Unrestricted** | | | | |
| General Fund | 16 | | 2,128,520 | 2,309,866 |
| Designated Funds | 17 | | 2,631,947 | 2,591,778 |
| Revaluation Reserve | 18 | | 376,021 | 263,795 |
| | | | £ 5,136,488 | £ 5,165,439 |

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 Geoff Bateman, Acting Chair 21 August 2015

# 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 (revised 2005) for Charities, applicable UK standards 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:

| | 2015 | 2014 |
|---|---|---|
| | £ | £ |
| Depreciation | 40,168 | 39,376 |
| Auditors' remuneration | 3,000 | 2,900 |

| Incoming Resources | Unrestricted Funds General | Other | 2015 | 2014 |
|---|---|---|---|---|
| | £ | £ | £ | £ |
| **4. Awards and Donations** | | | | |
| Membership donations | 446 | - | 446 | 10 |
| Legacies and other donations | 1,152 | - | 1,152 | 528 |
| Gift Aid | 2,523 | - | 2,523 | 750 |
| | 4,121 | - | 4,121 | 1,288 |
| **5. Activities for generating funds** | | | | |
| Land and building income: | | | | |
| Windermere | 15,873 | - | 15,873 | 11,350 |
| East Stoke | 165,661 | - | 165,661 | 203,783 |
| Windermere ferry contract | 18,093 | - | 18,093 | 20,083 |
| Miscellaneous income | 900 | - | 900 | 2,980 |
| | 200,527 | - | 200,527 | 238,196 |
| **6. Investment income** | | | | |
| Bank deposit interest | 198 | - | 198 | 204 |
| Investment Income | 55,463 | 2,568 | 58,031 | 62,298 |
| | 55,661 | 2,568 | 58,229 | 62,502 |
| **7. Charitable activities** | | | | |
| Membership services | 25,080 | - | 25,080 | 26,942 |
| Scientific and special publications | 17,499 | - | 17,499 | 25,624 |
| Journals | 47,798 | - | 47,798 | 61,542 |
| Research contracts | 40,112 | - | 40,112 | 102,392 |
| Scientific research & activity, direct funding and grants | 60,000 | - | 60,000 | 66,000 |
| Data & Information Services | 134,625 | - | 134,625 | 208,610 |
| FBA Library | 38,279 | - | 38,279 | 27,263 |
| Training courses and meetings | 64,909 | - | 64,909 | 64,468 |
| | 428,302 | - | 428,302 | 582,841 |

## THE FRESHWATER BIOLOGICAL ASSOCIATION
## NOTES TO THE ACCOUNTS (Continued)

| Resources Expended | Unrestricted Funds General | Other | 2015 | 2014 £ |
|---|---|---|---|---|
| **8. Cost of generating funds** | | | | |
| Land and buildings: | | | | |
| Windermere | 5,283 | - | 5,283 | 5,197 |
| East Stoke | 163,350 | - | 163,350 | 162,313 |
| Windermere ferry contract | 11,893 | - | 11,893 | 11,530 |
| | 180,526 | - | 180,526 | 179,040 |
| **9. Cost of charitable activities** | | | | |
| Membership services | 38,615 | - | 38,615 | 31,248 |
| Scientific and special publications | 48,466 | - | 48,466 | 48,412 |
| Journals | 37,136 | - | 37,136 | 36,777 |
| Research Contracts | 175,111 | | 175,111 | 257,581 |
| Scientific research activity, direct funding and grants | 61,670 | 4,974 | 66,644 | 59,666 |
| Data & Information Services | 164,590 | 148 | 164,738 | 165,988 |
| The FBA library | 100,000 | - | 100,000 | 109,402 |
| Training courses and meetings | 78,659 | - | 78,659 | 89,157 |
| | 704,247 | 5,122 | 709,369 | 798,231 |
| **10. Governance Costs** | | | | |
| Council meetings and reimbursements to Trustees | 9,154 | - | 9,154 | 14,204 |
| Other costs – direct and indirect: | | | | |
| Audit fees | 3,000 | - | 3,000 | 2,900 |
| Other professional fees | 95,946 | - | 95,946 | 16,489 |
| Staff costs | 30,449 | - | 30,449 | 29,232 |
| Irrecoverable VAT | 6,996 | - | 6,996 | 5,390 |
| | 145,545 | - | 145,545 | 68,215 |

### 11. Staff

Average number of employees was 24 (19 FTE) paid employees (2014: 23 (18 FTE)) during the year to 31st March 2015.

| Total Staff Costs in the year were: | 2015 £ | 2014 £ |
|---|---|---|
| Salaries | 498,924 | 496,260 |
| Employer's National Insurance Contributions | 30,427 | 22,930 |
| Employer's Pension contributions | 46,129 | 51,732 |
| Total | 575,480 | 570,922 |

There were no employees in the remuneration band £60,000 to £69,999, or above (2014: none).

### 12. Trustee Remuneration

No members of Council received any remuneration during the year. One member of Council received an honorarium of £865 (2014: £800) for services as FBA Books Editor, unrelated to his/her position as Trustee. Travel costs and Council expenses amounting to £9,154 (2014: £14,204) were paid for or reimbursed to 9 (2014: 11) 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 2014 | 1,955,000 | 137,908 | 26,034 | 2,118,942 |
| Additions | - | 32,350 | - | 32,350 |
| Disposals | - | (22,898) | - | (22,898) |
| Revaluation | 5,000 | - | - | 5,000 |
| At 31st March 2015 | 1,960,000 | 147,360 | 26,034 | 2,133,394 |
| Accumulated Depreciation | | | | |
| As at 1st April 2014 | 91,216 | 115,515 | 18,226 | 224,957 |
| Charge for the year | 22,804 | 14,760 | 2,604 | 40,168 |
| Depreciation Adjustments | (114,020) | (22,898) | - | (136,918) |
| At 31st March 2015 | - | 107,377 | 20,830 | 128,207 |
| Net book value | | | | |
| At 31st March 2015 | 1,960,000 | 39,983 | 5,204 | 2,005,187 |
| At 31st March 2014 | 1,863,784 | 22,393 | 7,808 | 1,893,985 |

The historical cost of Freehold Land & Buildings is £1,334,148 (2014: £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 2014 | | 3,215,407 |
| Additions/(Disposals) | | (289,259) |
| Investment Management fees | | (10,744) |
| Net Investment Gains: | | |
| Attributed to General Fund Account (Note 16) | 153,692 | |
| Gain on revaluation attributed to the Frost Bequest (Note 17) | 42,598 | |
| | | 196,290 |
| Market Value at 31st March 2015 | | 3,111,694 |

During the year, £300,000 of capital has been transferred from the account held at Investec (2014: £160,000) to assist with working capital requirements.

## THE FRESHWATER BIOLOGICAL ASSOCIATION
## NOTES TO THE ACCOUNTS (Continued)

**13. Fixed Assets (Cont)**

| | Quoted Investments £ |
|---|---|
| Acquisition Values | 1,866,199 |
| Represented by: | |
| Investments held on UK Stock Exchange | 3,060,653 |
| Cash held as part of Portfolio | 51,041 |
| | 3,111,694 |

The principal investments at 31st March 2015 were:

| | Market Value £ | % of Total % |
|---|---|---|
| M & G Charifund | | |
| 19,366 Income Units | 293,143 | 9.4 |
| 6,026 Accumulation Units | 1,210,540 | 38.9 |
| J P Morgan Asset Management Ltd | | |
| 199,174 Bond Units – A & B Funds | 280,058 | 9.0 |
| 114,966 UK Equity Fund Units | 333,886 | 10.7 |
| | 2,117,627 | 68 |

The accumulated units received during the year that were reinvested for capital growth had a cash value equivalent of £66,300 (2014: £61,034).

**14. Debtors**

| | 2015 £ | 2014 £ |
|---|---|---|
| Trade Debtors | 18,091 | 54,186 |
| Other Debtors | 65,879 | 84,870 |
| Prepayments | 44,328 | 38,239 |
| | 128,298 | 177,295 |

**15. Creditors**

| | | |
|---|---|---|
| PAYE, NIC and pension | 22,579 | 12,871 |
| Trade Creditors | 78,567 | 33,734 |
| Other Creditors and Accruals | 23,236 | 58,871 |
| Deferred income | 62,716 | 57,361 |
| VAT creditor | 6,928 | 29,792 |
| | 194,026 | 192,629 |

**16. General Fund Account**

| | 2015 £ | 2014 £ |
|---|---|---|
| General Fund Account | | |
| Balance brought forward | 2,309,866 | 2,265,137 |
| Net movement in funds before transfers and other recognised gains | (344,261) | (160,659) |
| | 1,965,605 | 2,104,478 |
| Transfer net movement to Other Funds (Notes 4 to 10) | 2,554 | 8,615 |
| Unrealised gain arising from revaluation of Investments (Note 13b) | 153,692 | 200,979 |
| Transfer from Revaluation Reserve (Note 18) | 6,794 | 6,794 |
| Transfer between Funds (Note 17) | (125) | (11,000) |
| | 2,128,520 | 2,309,866 |

# THE FRESHWATER BIOLOGICAL ASSOCIATION
## NOTES TO THE ACCOUNTS (Continued)

### 17. Other Funds

| | 31.3.2014 | Income | Expenditure | Transfers | 31.3.2015 |
|---|---|---|---|---|---|
| | £ | £ | £ | £ | £ |
| Unrestricted Designated | | | | | |
| Fritsch Fund | 23 | - | (148) | 125 | - |
| Frost Bequest | 584,765 | 42,598* | - | - | 627,363 |
| Frost Exhibition | - | 2,568 | (1,000) | - | 1,568 |
| Gilson Le Cren Fund | 6,990 | - | (3,974) | - | 3,016 |
| Freshwater Science Fund | 2,000,000 | - | - | - | 2,000,000 |
| Total | 2,591,778 | 45,166 | (5,122) | 125 | 2,631,947 |

*Gain 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:

| | 31.3.2015 | 31.3.2014 |
|---|---|---|
| | £ | £ |
| Tangible Fixed and Current Assets | 73,851 | 76,280 |
| Quoted Investments | 2,558,096 | 2,515,498 |
| | 2,631,947 | 2,591,778 |

Unrestricted Designated Funds represent 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. This fund has now been exhausted.
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 01.04.2014 | 263,795 |
| Surplus on revaluation | 119,020 |
| Transfer to general fund – difference on historical cost depreciation charge and actual depreciation charge on the revalued amount | (6,794) |
| Balance carried forward at 31.03.2015 | 376,021 |

### 19. Capital Commitments and Contingent Liabilities

There were no capital commitments or contingent liabilities at 31st March 2015.

### 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 31st March 2011. 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 2011), the market value of the assets of the scheme was £32,433.5 million and the value of the scheme's technical provisions was £35,343.7 million indicating a deficit of £2,910.2 million. The funding level was 91% 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 pay off the shortfall of £2,910.2 million by 31st March 2021 which requires the employers to make additional payments of 3.4% of salaries for the first six years to 31st March 2017, and of 2% for the four years to 31st March 2021.

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 2015 was £46,129 (2014: £51,731) 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 2015 were £6,695 (2014: £5,008).

# 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 2015 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 United Kingdom Accounting Standards (United Kingdom Generally Accepted Accounting Practice).

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 2015 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.

91 Gower Street
London
WC1E 6AB
21 August 2015

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