



# **EIGHTY-SIXTH ANNUAL REPORT**

**OF THE**

**FRESHWATER BIOLOGICAL ASSOCIATION**

and Accounts for the year ended 31st March 2018

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## THE FRESHWATER BIOLOGICAL ASSOCIATION

### OFFICERS AND COUNCIL

31st MARCH 2018

*President*

Professor L. Heathwaite, CBE FRSE

*Vice Presidents*

Dr A.D. Berrie  
Dr E. Buttle, CBE  
Professor J.M. Elliot  
Professor G.P. Harris

Sir Martin Holdgate, CBE  
Dr A. Powell, OBE  
Professor Sir William Stewart  
The Duke of Wellington

*Chair of Board*

Mr G. Bateman, OBE

*Honorary Treasurer*

Mr R. Middleton

### REPRESENTATIVE MEMBERS

The Royal Society – Professor K. Beven

### ELECTED MEMBERS OF BOARD

R. Chadd  
Dr A. Crowden

Professor G. Woodward

### FINANCE COMMITTEE

Mr G. Bateman  
Mr R. Middleton (Chair)  
R. Chadd

Dr B. Brierley  
\*Professor C.S. Reynolds

\*\*Mrs G. Stables (Finance Manager)

\* Co-opted Members

\*\* Attendees

### HONORARY MEMBERS OF THE ASSOCIATION

Dr J.S. Alabaster  
P.V. Allen  
Dr R.B. Angus  
Dr R.G. Bailey  
Dr I.A.E. Bayly  
J.A. Black  
B. Blofield  
Prof. R.O. Brinkhurst  
V.M. Brown  
K.E. Burnand  
T. Carrick  
Dr J.C. Chubb  
Dr D.W. Claridge  
Dr D. Cragg-Hine  
D.J. Cross  
Dr K.W. Cummins  
N.P. Cummins  
Dr D.H. Dalby  
Dr H. Disney  
Prof. J.D. Dodge  
Dr J.M. Edington  
J.H. Elliott

Prof. J.M. Elliott  
F.N. Farnham  
R.S. Fort  
Prof. J.J. George  
S. Gibb  
Dr D.S. Gibbons  
Dr H.L. Golterman  
Regents Prof. Emeritus E. Gorham  
T.V. Gudjonsson  
E.V. Hart  
Dr J.M. Hellawell  
J. Henderson  
J. Hobart  
P.H. Holway  
Dr J.V. Howarth  
Dr A.J. Juniper  
Prof. H. Kawanabe  
B.M. Kipling  
Prof. C.R. Kennedy  
Professor T.E.L. Langford  
Dr P.H. Langton  
Dr J.B. Leeming

Prof. P.S. Maitland  
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C.C. McCready  
Prof. P.J. Miller  
W.A. Mitchell  
Prof. C. Nalewajko  
Dr T.G. Northcote  
L.R. Peart  
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J. Roskell  
Dr D. Scott  
Prof. G.G.E. Scudder  
O. Simmonite  
Dr D. Stevenson  
Dr D.W. Sutcliffe  
Prof. J.D. Thomas  
M. Thompson  
Dr R.L. Welcomme  
The Duke of Westminster  
W.R. White  
F.M. Wiseman

## STAFF COMPLEMENT AT 31st MARCH 2018

Chief Executive	Dr Bill Brierley
Publications and Marketing Manager Membership Officer	Michelle Jordan Rosalind Maberly
Finance Manager	Gill Stables
Office Manager	Lesley Hadwin
IT Manager	Vanya Gordon
Admin Assistant, East Stoke	Claire Tozer
Estates Manager	Tim Ashberry
Facilities Manager	Matthew Freeman
Facilities Assistant	Martin Shepherd
Project Manager (Pearl Mussel) Pearl Mussel Project Officer	Dr Ceri Gibson Heather Marples
Anglers Riverfly Monitoring Initiative (ARMI) Project Manager Riverfly Project assistant	Ben Fitch Alex Domenge
Advisor	Dr Anne Powell
<i>Approximately 50% of staff are employed on part-time contracts</i>	
<i>Honorary Posts</i>	
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 David Harper Professor Alan Hildrew Dr Mike Ladle Dr John Murray-Bligh Dr Allan Pentecost Dr Paul J. Raven Professor Colin S. Reynolds Dr Roger A. Sweeting Dr Ian Wallace
Honorary Editors:	
<i>FBA Books</i>	Dr Alan Crowden
<i>Freshwater Reviews</i>	Professor Colin S. Reynolds

*Registered Auditors:*

Messrs Couch Bright King & Company, 91 Gower Street, London WC1E 6AB

*Banker:*

The Cooperative Bank  
147 Church Street  
Preston PR1 3UD

## Foreword from the President

I'm delighted to write this, my first, forward to the Annual Report of the Freshwater Biological Association: it seems the past year has flown by. During that time, the FBA has continued to adjust to functioning as a much smaller organisation, both in terms of estate and staffing. My sincere thanks to Professor Sir John Beddington previous President of the FBA for overseeing much of the transition, and to Chief Executive Bill Brierley and Chairman Geoff Bateman for implementing it. Change is never easy, and it is fair to say that there is still some way to go in defining the way the FBA will operate into the future. In this context, I was delighted to read the thoughtful and forward-looking report reviewing the role of the FBA Honorary Research Fellows (HRFs) by Rick Battarbee, Anne Powell and Michelle Jordan. Their report managed the difficult task of looking back and looking forward, and in my view provides *the* platform for the future of the FBA. As your President, my single ambition for the coming year is that we support and enable the FBA's executive team to take forward the recommendations of the HRF Review. In particular, I hope we can anchor the longstanding commitment of our HRFs to freshwater biology and the energy of our executive team to find effective ways to inspire younger freshwater scientists to become part of the FBA.

Fundamental and strategic freshwater science in the UK continues to be underpinned by funding from the Natural Environment Research Council (NERC) – an organisation that is itself evolving through the creation of UK Research and Innovation (UKRI). My quick reckoning suggests that between 2014-18 NERC funded over £30m competitive research grants broadly aligned to the freshwater sciences. The challenge for the FBA moving forward is how to *transition* this research into facilitating lasting outcomes for freshwater science, which has always been one of the FBA's chief objectives. The subtext is how to do this with limited resources and personnel. It is my personal view that this is not something that the FBA can undertake alone. We would all probably agree that the FBA needs to be more proactive in forming collaborations with research-based organisations to give critical mass to its remaining scientific capacity. But in my view, the FBA also needs to work much more closely with practitioners of freshwater management, such as the Rivers Trusts, and with the public through community engagement and citizen science. This would play to existing strengths in training and skills sets such as freshwater biology taxonomy that are scarcely available elsewhere. There is much to look forward to ahead.

Finally, I would like on behalf of the FBA to offer our sincere thanks our Chair, Geoff Bateman who is stepping down in March 2019. Geoff has been a steady influence and source of calm steering the FBA carefully through the many changes it has gone through of late. The continuing existence of the FBA owes a lot to Geoff. Thank you.

Louise Heathwaite  
September 2018

## Foreword from the Chair of the Board

As I pen this, my final foreword for the 2018 Annual report of the Freshwater Biological Association, I am reflecting on my three years as Chairman and can safely say I had no idea how hard they would turn out to be, for the organisation, its staff and the Board.

The charity sector is under assault from all sides and the environmental charities are competing ever harder for your support and project work. That said I am even more confident this year that the FBA will begin to rebuild its position in the environmental charity sector. For the first time in years the out-turn projection for the current financial year (2018-19) will be in balance. We have a secure income from our estate and the expectation of funds from the sale of the River Laboratory. A decision I know that is very disappointing but inevitable in the context of a much slimmed staff structure and reduction in FBA science and data project work. I hope that most members have seen little impairment as a result of the

changes and the membership team will be addressing improvements to services to members through 2018.

The transformed FBA will be launched in spring 2019 and will concentrate initially on membership, training, accreditation and externally funded project work where we have the appropriate skills and capabilities to assist and deliver. We will build partnerships with others and work to promote freshwaters wherever we can and this focus is needed more than ever in these uncertain political and economic times.

I expect the organisation to build on its strengths and regain its important position of advocacy for freshwaters and with the support of its staff, HRF's and our many friends in academia and beyond then the sky is the limit. I would like to send particular thanks to those HRF's that have contributed so much of their time freely and generously to the FBAs work and on whom we will rebuild the science focus.

I know our Chief Executive and his management team are looking forward to a bright future supported by a new and refreshed Board of Directors.

The FBA Board met twice and held several telecons and meetings with staff, together with weekly Chair and CEO updates in 2018. The Finance committee was re-formed and held two meetings and the Estates group has overseen the day to day operations and the River Laboratory sale plans. The Windermere annex conversion to holiday lets has been a great success and the pearl mussel project will be completed on time and budget and has resulted in a longer term research post funded by UU for at least the next four years. The hosting of the Riverfly partnership and the move from Salmon and Trout Conservation in April 2017 went well and funding was confirmed for 3 years from the Environment Agency.

I commend this Annual report to you and thank those who have contributed to its content throughout the whole year. Although I am stepping down once a new Chair is in post I hope to continue my involvement and will support the FBA in any way I can. I wish our President, the Board, staff and HRFs and all members and supporters the very best of luck in the forthcoming year and hope to meet many of you around the country as I regain my retirement. The work of the FBA is far too important to the UK freshwater environment not to be a leading advocate.

Geoff Bateman  
September 2018

## **Report from the Chief Executive**

Since I started in my post as CEO some three years ago I have started my annual report talking about the changes that have occurred during the previous 12 months. The changes that we had to make in 2017 were extremely significant relative to those of the previous two years and ones that I would not like to undertake again. We undertook a dramatic restructuring and downsizing of the organisation during the first half of the year and carried out a thorough review of the FBA's property assets. The Board tasked myself and the management team with developing a new Business model and plan with the aim of breaking even within 12 to 18 months. Many staff left the organisation during the spring and summer of 2017 and moved into new jobs and I would like to thank them all for their hard work and commitment over many years – a thanks to all of these staff was published in FBA News No 73. We also said goodbye to many Board Members at the October Board meeting – many of whom had remained as co-opted members to see the organisation through the difficult changes and I would like to thank them for the help and support over the years.

During the year, despite all the changes, we continued to deliver training courses, hosted meetings and attended conferences and workshops in the UK and abroad. In April we began

hosting of the Riverfly partnership and welcomed the two staff – Ben Fitch and Alex Domenge into the FBA ranks and funding for the work was secured from the Environment Agency for a further three years.

Since September 2017, we have re-focused our activities concentrating on membership publications, training and accreditation and providing new services to members and others. We have also concentrated on working more closely with our Honorary Fellows and with other similar organisations to enhance our visibility and delivery.

We have begun to rebuild working on the basics upwards. We are currently developing a new website and membership system that will be implemented and go live by the end of 2018. We are currently reviewing our training provisions and courses and will be developing new programmes and course for delivery with other partners in the next few years. We aim to deliver further publications to align to these training programmes and attract further young members and early career scientists both in the UK and abroad.

## Membership

The total number of members as at 31 March 2018 stood at 1169 (down 2.2% overall on the same period last year). There has been an increase of over 5% for the Student membership. A breakdown according to category is as follows:

Membership Category	March 2017	March 2018
Life	536	533
Individual	497	472
Student	79	83
Corporate	8	8
Honorary	73	71
Founder	2	2
<b>Totals</b>	<b>1195</b>	<b>1169</b>

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.

We are continuing to look into ways we can improve our membership benefits which includes a 'Members only' area, and we have also started a new benefit for students which is a fortnightly email listing upcoming opportunities (such as jobs, PhDs, courses and volunteer posts). This new benefit is proving popular amongst our student community.

## Publications

### *Books*

There are currently three books in production for the FBA: "A guide to adult Caddisflies" (for release late 2018), "A key to Stoneflies" (completion expected in 2019) and "A guide to Gastropods" (due during 2019).

### *FBA News:*

We would like to thank Professor Jonathan Grey for his contribution as Honorary Editor of *FBA News* over the years.

## Training

Training courses continue to be popular. During the year there has been a steady demand for programmed and bespoke courses, as well as continuation of accreditation, and general freshwater biology teaching.

### *Programmed Courses*

A schedule of programmed FBA courses was run in 2017-2018 and included:

Entomology for Anglers, Introductory Invertebrate Courses and Advanced Bioassessment - River InVertebrate Prediction And Classification System (RIVPACS)/River Invertebrate Classification Tool (RICT) bioassessment training

We continue to get very positive feedback on our courses and the quality of tutors and provision of materials.

The new training course programme for 2018 was produced and printed.

### *Bespoke Courses and Accreditation*

FBA's accreditation programme continues to grow with mixed-taxon level invertebrate identification examinations being held for both the EA and Natural Resources Wales. We also delivered bespoke invertebrate and algal identification courses to Severn Trent and Anglian Water. The FBA has been invited to feed into a Water Utility working group advising on quality assurance of methods and identification.

The FBA in collaboration with Bournemouth University ran a four-day Advanced Species Level Identification Course to a large group of Natural Environment Research Council (NERC) funded PhD students at the River Laboratory. As in previous years this course was oversubscribed and received very positive feedback.

### **Teaching**

FBA staff and Honorary Fellows continue to contribute to teaching for a number of university departments. The FBA also hosts and contributes to a variety of university visits and courses and it has signed a Memorandum of Understanding (MoU) with the University of Cumbria to contribute to the delivery of their BSc and MSc Aquatic conservation courses.

FBA university teaching, courses and field visits undertaken during the year included:

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

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

### *School Visits*

The River Laboratory hosted a number of educational visits from local schools.

### **Research and Scientific Contracts**

#### *Freshwater Pearl Mussel Projects*

The Pearl Mussel Project received ongoing funding from Natural England (NE), the Environment Agency and Biffa again this year.

The Restoring Freshwater Mussel Rivers in England, (funded by Biffa Award) successfully achieved ratification to year 3 for delivery this year. This funding supports the River Irt, Esk, and Dubbs Beck populations currently held at the Ark along with salary and overheads to facilitate the project. The project has continued to deliver to its targets and budget and the

first juveniles (10 years old) reared in the ARK were re-introduced into a river following river restoration work. The “teenage” mussels have been tracked since their release and appear to be doing well.

#### *Blandford Fly project*

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

#### *Long-Term Monitoring*

The River Laboratory Long-Term Monitoring (RLLTM) project seeks to understand the effects of climate on stream invertebrate communities. Macroinvertebrate and diatom samples together with macrophyte cover and substrate composition estimates were collected in April, July and October from the Rivers Frome and Piddle in Dorset with assistance from students and volunteers. Linked to these samples, the FBA also collect water temperature data and collate EA river flow and chemistry data.

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

#### **Grants**

The FBA contributed to an initiative of the European Federation of Freshwater Sciences (EFFS) to fund a collaborative European Freshwater Science Project for Young Researchers. The primary aim was to encourage young freshwater researchers across Europe to create synergistic interactions that lead to new knowledge, promote networking among young European Limnologists and offer experience in generating research ideas, acquiring funding, planning and carrying out a collaborative international scientific project. The second call was very successful with 4 proposals of a very high standard and the successful project was submitted by Sonia Herrero Ortega and Cleo Stratmann on “Urban Algae- Ecological Status and the Perception of Ecosystem Services of Urban Ponds”.

#### **Profile enhancement and attendance at Conferences, Workshops and Events**

Soraya Alvarez-Codesal, Eloy Benito-Reyes and myself attended the 10<sup>th</sup> Symposium for European Federation of Freshwater Sciences (SEFS10) held in Olomouc in the Czech Republic in July 2017. Soraya and Eloy both presented papers on the work they had been involved in and I attended the EFFS Board meeting.

As a founder member of the European Federation of Freshwater Sciences (EFFS), we continued our involvement by receiving applications from UK-based students for the best European PhD dissertation in freshwater sciences.

Ceri Gibson made a presentation on the Pearl Mussel work to the 3<sup>rd</sup> Cumbrian Lakes Forum in October 2017.

I made a presentation to the Environment Agency annual Fisheries and Biodiversity meeting in Birmingham on the work of the FBA and the value of citizen science networks and represented the FBA on the EA National Drought Advisory group.

## Links with other organisations

At a national level, the FBA has continued to have strong links, partnership or involvement with other organisations and societies, as a Board Member and steering Group Member for the Riverfly Partnership, a Trustee of the National Biodiversity Network (NBN).

Hosting the Riverfly Partnership brings a new group of some 2,500 Riverfly Partnership Monitors closer to the work of the FBA and presents a number of opportunities to promote closer working between FBA staff and members, and this large group of Riverfly Partnership citizen scientists. The FBA also assists the Riverfly Partnership with training, and is closely involved in several local hubs in the North West and North East of England.

The FBA and Dorset Wildlife Trust continued their development work on the new Riverfly Extended Groups Scheme allowing established Riverfly Monitors to record 28 groups of freshwater invertebrates. Initial feedback on the draft system from Riverfly Monitors in Dorset has been positive and future plans include testing across a wider geographical area. A poster on the new scheme was presented at the Riverfly Conference in November and a small print run of a new identification chart was funded by Wessex Water.

### **Estates:**

#### *Windermere Annexe*

The holiday lets went live in mid May 2017 and have been very successful and with very positive feedback. Occupancy rates from May 2017 to March 2018 exceeded expectations and were over 85%, which is very good for the first year of operations.

#### *Estates Review:*

The board requested we undertook a review of all of the FBA estate and requested a series of options, from keeping all assets to sale both Windermere and River Lab and operating out of a leased office, to be worked up and summarised for the 2017 October Board meeting. This report was submitted and discussed at length, further work was requested to provide more detail on several options and to report to the March 2018 Board meeting when a decision would be made. As members are now aware the Board made the decision that the FBA could not afford to continue to operate at two sites and that, with deep regret, the River Laboratory would be sold. The preferred option from the Board was to maintain the site as an environmental hub and for the FBA to keep a presence and have access to the river for training and research purposes.

#### *FBA Fellows and Volunteers*

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

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Professor Patrick Armitage	Dr John Murray-Bligh
Professor Phil Boon	Dr Allan Pentecost
Dr Glen George	Ian Pettman
Terence Gledhill	Dr Paul Raven
Dr David Harper	Professor Colin Reynolds
Dr Elizabeth Haworth	Dr Roger Sweeting
Professor Alan Hildrew	Dr Ian Wallace
Dr Mike Ladle	

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We would also like to thank the volunteers that have given so freely of their time to help the Association, in particular Brenda Leese, Anna Callaghan who have helped tremendously with the cataloguing and photography of the Fritsch Collection and Cath Maberly with work in the Library.

## Reports from Honorary Research Fellows

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

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

### **Patrick Armitage - *Invertebrate Ecology***

I continue to collaborate with University of Loughborough and Bournemouth University and maintain daily contact with my colleagues in the River Communities Group (formerly CEH but now School of Biological and Chemical Sciences, Queen Mary University of London - QMUL) in a collaborative role.

In October 2015 a Higher Level Stewardship scheme was implemented in the floodplain adjacent to the River Laboratory. This involved the dredging of several ditches including one which was surveyed by me in 1998. This, together with other data collected from the floodplain provided an opportunity to investigate recovery from dredging and to compare with historical data and assess the efficacy of the Natural England policies and inform future management decisions. Samples were taken between November 2015 and September 2016 with the help of a colleague Jon Bass and an MSc student (Jack Coleman) from the University of Bournemouth. The September results were compared with those from a survey carried out in September 1998. Macroinvertebrate taxon richness and abundance increased with time at all sites but at different rates. Both parameters showed a significant relationship with % cover of submerged and emergent plants. By September, vegetation re-established along the whole ditch but plant taxon richness was lower than in 1998. In September 2016 the macroinvertebrate communities of none of the sites was classified as of very high conservation value in contrast to the situation in September 1998 when three sites fell into this category. It is concluded that the HLS scheme would have benefitted from improved communication between landowners and stakeholders and closer adherence to ditch management guidelines. A further set of samples was taken in September 2017 to monitor changes.

We have also collected macroinvertebrate samples from the River Win, a local stream susceptible to high sediment loads and agricultural intensification within the catchment. This stream was the subject of a survey in 1993 and again we had the opportunity to compare current with historical data but despite a lot of enthusiasm from stakeholders no funding appeared. Wessex Water however funded the chemical analyses of monthly water samples collected by Jon Bass and myself. The anticipated funding for macroinvertebrate work was not forthcoming and much of my effort this year has been spent on processing these data. This has been completed and a paper has been submitted. A student from Royal Holloway will be examining chemical and flow data in the system with help of Wessex Water in 2018.

I attend the Bovington Conservation Group meetings and continue assisting staff from QMUL who are now handling the yearly survey of the Bovington Stream which drains the MOD tank training range and 2 sites on the River Frome. The run of data now covers the period 1998 to the present and as such will provide a valuable assessment of long term changes in macroinvertebrate faunal communities in this lowland chalk stream. Preliminary analysis of the data on the Bovington Stream is currently underway.

I continue to provide general help at the River Laboratory sorting library stock, clearing rooms of accumulated 'stuff', tidying the fluvarium, working with students, and showing visitors around the site.

**Publications/Reports:**

1. Pretty J, et al (2017) *Macroinvertebrate surveys of the Bovington Stream and River Frome*. Report Commissioned by Debut Services (South West) Ltd on behalf of the Ministry of Defence
2. Armitage P.D. Bass J.A.B., Coleman J.W., Jones, J.I. and Kaplan, T. (2017) Faunal and floral response to the dredging of a River Frome floodplain ditch, (Dorset, UK). *Proceedings of the Dorset Natural History and Archaeological Society* 138: 67- 76.
3. Armitage P.D. Bass J.A.B., Murphy J.F. and Tapia, G. (submitted). A comparison of the freshwater invertebrate communities of the River Win (Dorset, UK) present in 1993 and 2016, over a period with agricultural intensification across the catchment.

**D.G. George - Limnology and zooplankton ecology**

Glen George is also a visiting professor at University College London and Aberystwyth University. In 2017, his main activities were:

1. Editing and proof reading a book (in Welsh) on the early history of Northern Britain.
2. Revising a draft of a paper on the impact of extreme weather events on the dynamics of Llyn Tegid (Snowdonia).
3. Completing the map and statistical analyses required to inform a paper on the Landscape Limnology of the English Lake District.

In the first half of the year I spent some time editing and proof reading my book 'Golwg Newydd ar yr Hen Ogledd' (A New Look at the Old North) that was published by Gwasg Carreg Gwalch in August. This book paid particular attention to the Welsh kingdoms that ruled the North West from the post-Roman period to the coming of the Normans and included some palaeolimnological analyses of land-use changes in the Lake District. In the second half of the year more time was devoted to the analysis of the high-resolution data acquired by a Lake Dynamics Monitoring Station (LDMS) deployed on Llyn Tegid. The first draft of a paper on the impact of extreme weather events on the dynamics of this lake is now complete and is based on an almost unbroken record of eight years of continuous measurement. My main objective in 2018 is to draft a paper on the Landscape Limnology of the English Lake District. This will, in essence, be a modern version of the classic Pearsall paper and will be based on the land-use data acquired by the National Park in the 1970's. The Marcé *et al.* paper mentioned in last year's report has now been published and has proved of interest to a wide range of technical as well as scientific readers.

**Publications:**

1. George, D.G. (2017) *Golwg Newydd ar yr Hen Ogledd*. (Gwasg Carreg Gwalch, Llanrwst), 365 pp.
2. Marcé, R., George, D.G. and twenty four others (2016) Automatic High Frequency Monitoring for Improved Lake and Reservoir Management. *Environmental Science and Technology*, 50, 10780-10794.

**Terry Gledhill - Invertebrate Taxonomy**

Work on the revised and annotated check-list of the freshwater mites of Great Britain and Ireland, although almost completed, took a back-seat following an invitation to collaborate with colleagues (Dr Reinhard Gerecke, University of Tuebingen and Dr Peter Martin, Christian-Albrechts-University, Kiel) on a project concerning water mites as inhabitants of groundwater-influenced habitats.

Of the 970 now recognized European species, 137 are crenobiontic (living exclusively in springs).

Topics considered were:- the significance of spring habitats for the diversity of water mites – percentage of crenobionts/crenophiles at different geographical latitudes; regional stenotopy – intraspecific differences in habitat preference between populations at different latitudes;

communities colonizing springs versus the hyporheic – similarities and differences; the evolution of crenobiosis in water mites – potential governing factors; endangered species – direct and indirect anthropogenic threats to the natural diversity of water mites.

**Publication:**

1. Gerecke, R., Martin, P. and Gledhill, T. 2017. Water mites (Acari: Parasitengona:Hydrachnidia) as inhabitants of groundwater-influenced habitats – considerations following an update of Limnofauna Europaea. *Limnologica*. <https://doi.org/10.1016/j.limno.2017.11.008>. 1-13.

**Elizabeth Haworth - Fritsch Collection**

It has been a very productive year in the Fritsch Collection. Since last March Brenda Leese (Wednesday volunteer) and I have concentrated on digitizing the Desmid Collection, photographing over 4000 sheets! Having completed the large genus *Staurastrum*, we are now working on the last c1000 sheets to complete the Desmid images. Corrections, repairs and replacements have also been made. We do have to keep asking for more space. Images are provided when requested, especially to David Williamson. Brenda also continues to enter new (author indexed) algal species, mainly diatoms.

We are now also preparing an A – Z series of algal posts which Ros Maberly will add to the FBA page of Face Book.

Anna Callaghan (Friday volunteer) has now checked ¾ of the Chrysophyte sheets, so that will be our next digital challenge!

A paper resulting from a Fritsch Collection international collaboration will be published shortly. The acknowledgements include - “*We are also very grateful for the use of the Fritsch Collection of Algal Illustrations and the library of the Freshwater Biological Association.*”

I have been collaborating with Allan Pentecost over the list of Cumbrian algae. The Macroalgae Course in May was cancelled but I was delighted that our planned Desmid weekend in September was so successful, with 16 members of the British Phycological and Quekett Microscopical Societies attending here. I also enjoyed a field day at tarns near Torver with the 2 Dutch visitors. A repeat has been requested.

I also gave talks to the FBA AGM about our Fritsch Collection work and to the British Diatomists weekend at Malham Tarn, on the pitfalls in taxonomy.

There have been various queries and I have been contacted by a grandson of Prof. Fritsch who hopes to visit when next in this area. It has been exciting to have first-hand information about the family and the musical connections.

**Publication:**

1. Saber, Abdullah A., Kouwets, Frans A.C, Haworth, Elizabeth Y. & Cantonati, Marco. A new *Euastrum* species (Conjugatophyceae, Streptophyta) from the Western Desert of Egypt, *Cryptogamie*.

**Alan Hildrew - Ecology of Streams and Rivers**

This has been another stressful year in terms of health. Amongst other things, this meant that I could not attend the latest SEFS conference in the summer, the first I have missed since they began. However, I am very pleased to say that my recovery from a very difficult 12 months (October 2016 to October 2017) has been good and I am now functioning at something more like normal. In terms of research, three solid papers appeared in journals (see below). I already reported on the contents of two of them that were *in press* last year (*Science of the Total Environment* and *Freshwater Biology*), while the most recent (in *Limnology and Oceanography*) is perhaps the most novel. Stemming from a NERC project

with colleagues at Queen Mary University of London, this paper shows that the biomass produced by methanotrophic bacteria can contribute up to about 10% or more of that produced by photosynthesis in chalk streams, reaching a maximum value in shaded reaches. These bacteria oxidise methane produced chemosynthetically by methanogenic bacteria, and this 'methane-derived carbon' is then apparently assimilated by some animal grazers in the stream food web. This thus constitutes a possible 'third way' in which stream food webs are supported – the first two being via grazing of in-stream plant production and by the decomposition of imported material derived from terrestrial plants. Further research, which we are presently trying to write up, suggests that this phenomenon is not restricted to chalk streams but is widespread in streams draining other geological formations in the UK, including sandstone and carboniferous limestone. This thus suggests that this 'novel' food web pathway may be of more general occurrence (and thus greater significance) than in chalk streams alone.

One book was completed, thus fulfilling the obligations that come with the award of the '*Excellence in Ecology*' Prize for Freshwater Ecology from the Inter-Research organisation in Germany. I am presently still awaiting proofs but the book will appear during 2018 (it was delivered to the publishers in September 2017). Using the example of freshwater acidification, its theme is to emphasise the part that natural historical approaches play in ecology and thus that they can be relevant to policy. I have now embarked on another book, for Oxford University Press in their 'Biology of Habitats' series, this time on 'The Biology of Streams and Rivers' to be written with Professor Paul Giller of the University of Cork. This replaces a much older book under the same title by Giller and Bjorn Malmquist. Our target is to submit the new book in spring 2019 and writing will take up most of my time in the next year or so.

Two less formal articles are scheduled to appear in 2018, both under the title of 'Return of the native', dealing with the recolonization by brown trout of acidified streams after the latter have shown some chemical recovery. This piece was originally written for the Wild Trout Trust newsletter, and was then modified for an issue of the FBA Newsletter.

Other activities include Chairing a 'stakeholders' meeting in the New Forest for a project by Natural England and the Forestry Commission to write a restoration strategy for streams and wetlands. This was potentially a 'hot potato' locally, since some earlier projects proved controversial among commoners and land-owners, but at least these early preparations for the new strategy passed off smoothly.

I remain one of the FBA's representatives on the European Federation for Freshwater Sciences (EFFS) which, among other things, oversees the biannual SEFS conferences – of which FBA was the founder. I contributed to a proposal from FBA to the other European Societies represented on EFFS about new developments, and (with Bill Brierley) met the new Chair of EFFS, Professor Antonio Camacho from the University of Valencia, to discuss a way forward for this European initiative and how FBA can continue to play a prominent role (despite BREXIT!). I am also a judge (representing FBA) in the second competition for a small grant to support research cooperation among young and/or early-career European researchers.

### **Publications:**

1. Hildrew, A.G., Durance, I. & Statzner, B. Persistent longitudinal distribution of stream insects in the face of climate change: a tale of two rivers. *Science of the Total Environment*, 574, 1294-304. 10.1016/j.scitotenv.2016.07.212
2. Ings, N.L., King, L., McGowan, S. & Grey, J. & Hildrew, A.G. Modification of littoral algal assemblages by gardening caddisfly larvae. *Freshwater Biology*, 62, 507-518. doi:10.1111/fwb.12881
3. Shelley, F., Ings, N., Hildrew, A.G., Trimmer, M. & Grey, J. Bringing methanotrophy in rivers out of the shadows. *Limnology & Oceanography*, 62, 2345-2359.

4. *In press*: Hildrew, A.G. Freshwater acidification – natural history, ecology and environmental policy. 'Excellence in Ecology', Volume 27, Inter-Research, Dübendorf, Germany, 176pp.
5. Hildrew, A.G. Return of the native. *Wild Trout Conservation Trust Newsletter*, Wild Trout Conservation Trust.

### **Mike Ladle - Ecology of Fish**

In 2017 Dr Stewart Welton and I were again contracted by North Dorset District Council, under the auspices of the FBA, to control the Blandford Fly. As mentioned last year monitoring has been reduced but the treatment appears still to be as effective as ever. The *Bfl* formulation - **VectoBac 12AS** - was again successfully applied at selected sites, on the basis of EA discharge data. After prolonged negotiations involving the North Dorset District Council, the suppliers of Vectobac 12AS, HSE and ourselves permission to treat the River Stour was extended and treatment was carried out. Still no further progress has been made on the possible introduction of a longer term (c. 5 year) plan for treatment and once more we await the final clearance to allow treatment in March-April 2018.

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

I continue to be responsible for the administration of the FBA fishing at West Holme, dealing with the fishermen, fees, fishing rota and reporting on the state of the fishery, its banks and bridges etc.

The bridge at West Holme has now been repaired and despite an increase in fees the fishing for 2018 is again oversubscribed.

The count of salmon on the Frome in 2017 was well up on the previous year. The relatively low salmon catch does not reflect the numbers of fish which were present and this is likely to be due to river conditions and the usual variation in fishing effort.

**Total for 2017** 11 Salmon to 15lb, 12 Out of season salmon, 60 Seatrout to 10lb (+ brown trout), 19 Grayling, 1 pike, 1 mullet

### **Publications:**

1. Welton, J.S., Ladle, M. & Bowker J.D. (2017). An experimental treatment of *Simulium posticatum* with *Bti* at selected sites on the River Stour, Dorset. **Report to North Dorset District Council**, 10pp.
2. Ladle M. (2017-2018) Monthly features for Sea Angler magazine published by Bauer Media

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 and I shall be advising on and assisting with a BBC Radio programme relating to River Frome pike in early March.

### **Allan Pentecost - Limnology and Algology**

A busy year with a several research projects, courses and editorial work undertaken. The study of *Nostoc* at Whitbarrow continues with accumulated data on the total and dissolved inorganic phosphate levels of the surrounding water and continued regular sampling for growth rates. This year, with increased colony number sampled, showed a strong growth peak in mid summer and negligible growth in winter. The courses on phytoplankton and macroalgae were not given this year but they will both be running in 2018. A successful desmid workshop was run in mid-September by Martyn Kelly, Liz Haworth and myself with a number of new records for the county. Two papers were published in *Hydrobiologia* following the International Cyanobacterial Association Symposium in Austria the previous year.

The survey of UK sulphur springs has continued with three more sites visited, microbial samples taken and waters analysed. The Freshwater Algae of Cumbria is also well advanced and the diatom list is now close to completion. In excess of 2200 species of freshwater algae is now reported from Cumbria. A talk on some of this work was given at the FBA meeting held in October jointly with Liz Haworth. Professor Whitton and myself also visited some calcareous streams in North Yorkshire to collect *Rivularia* for molecular studies and we discovered a new and significant site for the rare desmid *Oocardium stratum*. Work on the Phosphorus book/article has continued with the addition of notes from further papers and rearrangement of the text.

### **Ian Pettman - Data and Information Retrieval**

Throughout this reporting year I spent the majority of my time on revenue generation work for the FBA rather than research. Hence, I have no publications to report for this period.

#### *Aquatic Sciences and Fisheries Abstracts (ASFA) Work*

The main work and outputs were:

Completion of ASFA contract already secured in 2016

I drafted, presented and secured a bid for the ASFA Trust Fund in 2016. This involved uploading 500 EA Reports from the old Freshwater Life site to the FBA's AEDA repository and preparing ASFA records for these and another 500 EA reports (1000 in total) to be undertaken from January to July 2017.

The original plan was for Isabelle Charmantier to undertake this work but she left and her post was not replaced. I undertook the completion of this contract (760 records remaining). With the difficult FBA financial situation, I worked full time on this for 2 months in order to complete the contract and submit the final report enabling FBA to receive payment early.

#### *Regular Input*

I provided the FBA's 2017 input of 300 records to the ASFA database and have started the 2018 regular input (January file of 34 records so far). Eligibility for bidding against the ASFA Trust Fund is dependent on production of regular input.

#### *Preparation of Contract Bid for 2017/18*

I drafted and subsequently secured another ASFA Trust Fund contract for the FBA, to be undertaken from September 2017 to February 2018. This entailed discussions with the ASFA Secretariat followed by an email discussion and vote with the 68 international partners.

The work entailed identifying and preparing ASFA records for 1000 UK open access PhD theses relevant to the aquatic sciences. I completed this contract in December 2017 (2 months early).

#### *Preparation of Contract Bid for 2018*

I have now drafted another ASFA Trust Fund contract for the FBA, to be presented and defended at the 2018 ASFA Board Meeting in Oostende in June 2018.

The work will be a continuation of the 2017/18 contract detailed above. The proposed time line, if successful, would be 1st September 2018 to end of January 2019.

#### *Impact Evaluation*

I chaired the Working Group in Viet Nam in 2016 and followed up with some further discussion documents but I stood down from the Working Group in 2017 to concentrate on the contract work detailed above.

Subsequently, following the recruitment of a Dalhousie University MSc student to undertake the first stage of this evaluation, I have been asked to retake the chair for the second stage in 2018.

#### *Representing FBA*

I represented the FBA in its role of National Centre and presented a case for the 2017/18 Trust Fund contract at the ASFA Secretariat office in Rome on Monday 12<sup>th</sup> June 2017. (This was at no cost to the FBA).

I have been asked to Chair the 2018 UN FAO ASFA Board Meeting, Oostende for the 5 days of 11 – 15 June 2018.

### **Paul Raven - *River Ecology and Morphology***

River-related activities undertaken in my capacity as an FBA honorary research fellow have been very limited this year.

As a corresponding member of a technical working group chaired by Phil Boon, I made technical comments on the revision to the European (CEN) guidance standard on assessing the hydro-morphological features of rivers. I gave a talk on rivers to a sizeable and very attentive U3A audience in Wells Museum in November, and have been developing a paper with Professors Malcolm Newson and John Lewin on the folly of short-term, counter-productive 'river improvements' in response to headline-making floods. This paper is written in simple language, but the purpose, using historical context and examples, is to expose the recurring myths used to justify knee-jerk responses, and to promote practical measures and shared responsibility for river management throughout the catchment. Fluvial geomorphology has not made the breakthrough it should have done over the past 50 years because of baffling technical language used and a failure to influence teaching on British rivers in the education curriculum. We hope that there will be a new age of enlightenment sparked by a better understanding of how rivers behave which is relevant to the British public and understood by children from their early schooldays. A rivers equivalent of *Blue Planet* might be able to trigger that; perhaps the FBA might like to approach the BBC with a proposal? The collective wisdom and experience of HRFs could be put to excellent use, and the FBA profile raised considerably.

The reason for my dwindling involvement in river-related matters over the past six years is that my focus on original research is now firmly on other areas of natural history. I am studying factors affecting the singing activity of migrant warblers and also the population dynamics of silver-washed fritillary butterflies, using wing markings and damage patterns to track individuals within a small breeding colony. The study area for both is a short cycle ride from home and I don't need special laboratory or library facilities. My carbon footprint is therefore heroically small.

### **Ian Wallace - *Taxonomy and Distribution of Trichoptera***

The focus of my work during 2017 continued to be the UK Caddis Recording Scheme, which I administer in a voluntary capacity. This now has 422,000 entries and will be submitted to the National Biodiversity Network this year, for distribution mapping and open access of its data. I am also continuing to edit the species accounts being written for a formal 'Atlas' and the FBA library will be invaluable in completing those this year. The recording scheme requires that I referee many records under the iRECORD system. I used the data to improve the PANTHEON site assessment system of Natural England. Records from the scheme will be published by DAET (Distribution Atlas of the European Trichoptera); this is a Biofresh Project of the EU.

I continue to supply county lists to people seeking to promote the group to their local recorders. I have personally provided a list for the Highlands of Scotland which was published in the Highland Naturalist and I have also contributed a list of North-west England and North Wales caddis for the Tanyptera project web-site; also a provisional list of stoneflies for that web site.

The Recording Scheme falls under the umbrella of the Biological Records Centre, but is also in a grouping called the Riverfly Recording Schemes. That group's annual meeting in 2017 confirmed that we wished to be closely associated with the Riverfly Partnership and thus the FBA. We look forward to being able to formalise that and contribute material to the FBA website when that is ready. I am organising the 2018 meeting in the Wyre Forest.

I attended the annual conferences of the National Forum for Biological Recording (NFBR) and the National Biodiversity Network (NBN). I gave the Caddis Recording Scheme as my address, but a more formal association with the FBA would enable that to be added too.

Field survey reports have been supplied for site managers of nature reserves at Coed-y-Cerrig, Cors Goch, Cors Erddreiniog, Newborough Warren and Taf Fechan. This year I have work planned at Thompson Common in Norfolk, the two Anglesey Cors, and various North West sites for *Anabolia brevipennis* and *Ylodes simulans*.

On other publications, work has not started in earnest on the new FBA Caseless Caddis Larval Key but the final collection of necessary material is being made. I am working with others in producing an Aidgap Guide to adult caddis as part of the long-running Field Studies Council series with that general title; they produced my Simple Key to Caddis Larvae as an Aidgap Key several years ago and I will be starting work on an up-date of that too. I will be talking generally about photo guides at the NFBR Conference this May – it is a controversial subject. FBA, and other, keys are in need of constant but gradual improvement. These improvements can go un-published until a new edition appears but the Riverfly Recording Schemes are assembling them under the general title of “Key Discussions” that they hope to place on the FBA web site when that is ready to receive them. I am assembling the Worthington Caddis drawings, which appeared in the 1974 Macan Key, for a hoped re-issue by the FBA. I have been talking to Stuart Crofts about various aspects of his new FBA book on the aerial stages of insects that have aquatic larvae.

I formally and informally refereed several papers from authors in the UK and Europe.

Concerning direct work for the FBA, I gave a presentation at the 2017 AGM and also ran a Caddis Course at Windermere. I undertook most of the re-housing of the FBA pinned insect collection, and advised about the re-housing of the fluid collections, as part of the PRISM funded project.

### **Phil Boon - Freshwater Conservation**

As I was appointed an HRF only last October I am still relatively new to the role, but not to the FBA. I first joined the FBA as a postgraduate at Newcastle University in the 1970s, working for a PhD on Trichopteran populations in the River North Tyne before the construction of Kielder Water, and enjoyed many visits to the FBA and many stimulating discussions with FBA staff.

I retired as Head of Ecosystems and Biodiversity at Scottish Natural Heritage in May 2017. Since retirement, much of my time has been taken up as Chief Editor of *Aquatic Conservation: Marine and Freshwater Ecosystems* (AQC), with my FBA affiliation now used for all journal business. I was responsible (nearly 30 years ago) for suggesting to John Wiley & Sons Ltd that they should consider publishing a new journal that would focus on the conservation of aquatic habitats and species, and as a result AQC published its first issue in 1991. Now in its 27<sup>th</sup> year the size of the journal has increased from four issues per year, with an annual page budget of about 360, to six issues and more than 1200 pages. During that time the impact factor has risen from 0.5 to 3.13. Several special issues and supplements are under production at the moment or planned, including one linked with the forthcoming centenary meeting of the Scottish Freshwater Group, one with the working title of ‘Freshwater conservation in the Anthropocene’, and others covering aquatic conservation in New Zealand, and in the Amazon Basin. The journal has an international readership; for example, in 2017 papers were submitted from 45 countries around the world. It is surprising, however, that only about 5% of the freshwater manuscripts submitted to AQC are from the UK, and I would be interested to find ways of stimulating further UK publications through my role at the FBA.

Ove the years with SNH I was heavily involved in research and policy on freshwater pearl mussel (*Margaritifera margaritifera*). Given the work on Project Ark that the FBA has led at

the Windermere laboratory, this is an area that I am looking forward to developing further as an HRF. Over the last few months I have had discussions with Ceri Gibson over a proposed conference on freshwater pearl mussel conservation that the FBA are planning to hold in the autumn. I am also working with others on a manuscript to describe the development and use of a recently published European standard for monitoring freshwater pearl mussels and their river environment. This has formed just a small part of my wider involvement with the European Committee for Standardization (CEN) over the last 20 years.

There are still further discussions to have with the FBA over work items that might be appropriate for carrying out as part of my HRF role. These include a continuing involvement with an inter-agency IUCN (UK) project on river restoration in Britain and Ireland; my role as member of the Board of Directors of the River Restoration Centre; collaboration with ECOSTAT (the European Commission's group on the Water Framework Directive) on hydromorphology and on invasive non-native species; and my recent appointment to the Freshwater Sub-Committee of the IUCN's Species Survival Commission. I am greatly looking forward to contributing over the next year to the further development of freshwater conservation at the FBA, and in particular to exploring opportunities for research, teaching and publication.

### **John Davy-Bowker – Invertebrate ecology and bioassessment**

As a former member of FBA staff, I was appointed to this role at the October 2017 Council meeting.

Despite only having been an HRF for 6 months I have delivered a very considerable amount of relevant activity on behalf of the FBA, including numerous training courses, site tours, and a wide range of scientific activities.

In my capacity as an FBA HRF I have delivered numerous training courses on behalf of the FBA, acted as a scientific advisor, delivered several scientific publications and hosted a range of external guests. This activities are detailed below:

- August 2017 – paper on Riverfly data, co-authored with Steve Brooks and Ben Fitch submitted.
- September 2017 – paper on the hydrological regimes of freshwater macroinvertebrates (making heavy use of UK RIVPACS data) with numerous international co-authors accepted for publication.
- September 2017 – Led delivery of the NERC funded FBA training course *Freshwater Advanced Training Short Course* at FBA Windermere, working with the tutors Richard Chadd (Environment Agency) and Mike Dobson (APEM).
- September 2017 – led a visit for Oxford University MSc Water Management students and tutors at the FBA River Laboratory.
- October 2017 – completed a baseline survey report of freshwater habitats at the Studland National Nature Reserve (Dorset).
- October 2017 – building on former work with the FBA, delivered a report on freshwater benefits of river restoration in the New Forest (via Bournemouth University).
- October 2017 – along with some 20 Agency staff, I represented the FBA at a trial of airlift sampling in Lincolnshire organised by Richard Chadd and Chris Extence.
- October 2017 – Lead tutor on FBA RIVPACS/RICT training course at the FBA River Laboratory
- October 2017 – along with Genoveva Esteban (Bournemouth University) hosted a visit from the internationally renowned scientist Larry Neilsen, Professor of Natural Resources, North Carolina State University. Estimated some 75 guests, many external attended. Profile of River Laboratory raised.
- October 2017 – self funded River Lab Long Term Monitoring on the rivers Frome and Piddle, Dorset.

- October and November 2017 – lead tutor on two freshwater bioassessment training courses for the FBA for Southampton University undergraduates at the FBA River Laboratory.
- October 2017 to January 2018 – worked with Angus Menzies (Dorset Wildlife Trust) to review pilot testing feedback and plan next steps for the development of the Extended Riverfly Monitoring Scheme. This is a new 28-group system developed by myself and Angus that is proving very popular with Riverfly Monitors.
- November 2017 – senior tutor on FBA *Freshwater Biotic Assessment (including Examination)* training course at FBA Windermere. Also marked the exams. This maintained FBA's position as accreditor of freshwater macroinvertebrate identification skills for Agency staff and others.
- November 2017 – led a site tour at the River Lab for a site visit by staff from Dorset Wildlife Trust.
- January 2018 – paper accepted on the UK rediscovery of the extinct stonefly *Isogenus nubecula* submitted (also a cover story in *FBA News*, a news item in *FBA Matters* and included in an article I wrote for the National Biodiversity Network annual report).
- January 2018 – commenced work on an FBA contract to recalibrate a stressor-independent RIVPACS model with newly derived GIS data from CEH. This SEPA funded contract will derive income to the FBA as well as maintaining FBA's lead scientific role in RIVPACS/RICT applied science.
- February 2018 – I shall be attending the National Biodiversity Network board meeting as the nominated FBA trustee. This is likely to be my last meeting in this capacity because board membership is rotating. I have represented the FBA and the interests of freshwaters through the NBN board for the last four years and missed very few meetings.

I deliver some of my work through the FBA and some through other routes. I take every opportunity to represent the FBA as a primary affiliation on publications or when working with external audiences. My work is also spread across both FBA sites with courses in particular being delivered both at the River Lab and Windermere.

**THE FRESHWATER BIOLOGICAL ASSOCIATION  
(A COMPANY LIMITED BY GUARANTEE)**

**ACCOUNTS**

**FOR THE YEAR ENDED 31ST MARCH 2018**

**COMPANY NUMBER: 00263162**

F1473-18  
12.09.2018

**THE FRESHWATER BIOLOGICAL ASSOCIATION  
(A COMPANY LIMITED BY GUARANTEE)  
DIRECTORS' REPORT FOR THE YEAR ENDED 31ST MARCH 2018**

The members of the Board of the Freshwater Biological Association (the Association), acting as Directors of the Association submit their Annual Report and audited Accounts for the year ended 31st March 2018.

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.

### **Directors**

The Directors of the Freshwater Biological Association during the period 1st April 2017 to 31st March 2018 are listed on page 4 of the Directors' Report. The majority of the members of the Board of Directors are nominated by either the Board or the general membership and proposed for election at the AGM. These appointments are for four years but can then be reappointed to serve a second consecutive term after when they must cease to be a director for at least 12 months before they are eligible for appointment again. A further Director is nominated by The Royal Society. The Fishmongers' Company nominated a further Director until October 2017 when they no longer nominate representative members. A review of Directors' skills is periodically undertaken and this is used to inform the nomination process for prospective Directors.

### **Statement of Directors' Responsibilities**

The Directors are responsible for preparing the Annual Report and the Financial Statements in accordance with applicable law and regulations.

Company law requires the Directors 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 Board 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 Directors 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 Directors 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.

In accordance with company law, as the Directors 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 Board of Directors 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 Directors 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 clause 9 of the Articles of Association and limits the liability of the members to £10 each.

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

**THE FRESHWATER BIOLOGICAL ASSOCIATION  
DIRECTORS' REPORT FOR THE YEAR ENDED 31ST MARCH 2018  
(Continued)**

**Objectives of the Charity**

The objects of the Association, as defined by its Memorandum, are to promote the understanding and 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 review of governance was completed in 2016 with the adoption by special resolution of the new Articles of Association at the Annual General Meeting on 13 October 2016. The Articles were subsequently approved by the Charity Commission. There are changes in names/titles between the old and new articles with Trustees now being called Directors and Council are now called the Board.

With regard to the capital projects the building work for the conversion for the Ferry House Annexe was completed for letting from May 2017.

Following the decision made by the Board in February 2017, in order to stabilise and ensure the continuing operation of the FBA, the immediate reduction of expenditure led to the review of staffing as outlined in the business case, which was implemented from March 2017 onwards. Restructuring was completed by September 2017.

The operating deficit before net gain on investments £10,067 (2017: £199,269) is £432,091 (2017: £694,698). Cashflow was funded by the withdrawal of £607,415 from the Investment portfolio. The annexe conversion began in May 2016 and completed in May 2017 accounts for further increase in capital expenditure. Additional funds were required to supplement the working capital requirements of the organisation and the review of staff and restructuring following the decision made by Council in February 2017.

Income from Scientific projects includes the Biffa awarded £1.46 million three year Pearl Mussel project, involving 5 partners in England The project commenced in March 2015 and had one year to run, it has, however, been extended to December 2018. The Freshwater Pearl Mussel ARK Project continues with support from Natural England (NE). In April 2017 the FBA took over hosting the Riverfly Partnership Project from the Salmon and Trout Conservation. The project is currently funded by the Environment Agency for the next three years. Funding in the year to March 2018 was £50,000.

Membership numbers decreased by 2.5% overall – but student membership increased by 4%. We received a bequest from Mr R I Webb for £5,000 to be used for research projects and for the provision of equipment and support for training. Mr Webb had been a Life member for 42 years.

The SIL Contract for the Inland Waters Journal ended in 2017 which accounts for the decrease in the Publications income. There have been no new publications since 2015. New publications are now in production for 2018-2019.

The contract for the Windermere Ferry was terminated in July 2017, following changes made by Cumbria County Council which substantially reduced the cash turnover, reduced the commission and also increased the administrative costs.

The Annexe has been the main area of activity for generating funds at Windermere with an income via holiday letting agencies of £86,433.

The main area of increase in activity at East Stoke in this period was generated by a two year fixed term lease agreement.

Expenditure during 2017-2018 includes the additional costs related to further organisational changes and these included staff reorganisation and restructuring costs of £115,405 and associated professional fees of £40,331.

**THE FRESHWATER BIOLOGICAL ASSOCIATION**  
**DIRECTORS' REPORT FOR THE YEAR ENDED 31ST MARCH 2018**  
**(Continued)**

The scientific research activity and funding of grants is considered by the Directors 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 Directors 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 Directors ensure that any investments held reflect the ethical considerations of the Association and that no investment shall be held that is contrary to its objectives.

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

**Plans for Future Periods**

Towards the end of 2016 the financial position that the FBA found itself in, including the level of its reserves, meant that significant action needed to be taken to stabilise, recover and remedy the position with immediate effect.

The emergency plans, authorised by the Board, to immediately reduce the cost base of the FBA were implemented during the first part of the financial year.

A new business plan and a business case for the changes were approved by the Board in March 2017. Significant downsizing of staff, restructuring and focussing on key activities, membership, publications and training were implemented by September 2017. This would allow the FBA budget to break even within 12-18 months.

The Board also requested a thorough review of the FBA's estates, providing a series of options to maximise income. The estates review was overseen by an estates group made up of Staff and Directors and reported to the Board in March 2018. The Board took the decision, with great regret, to withdraw operations from the River Laboratory as current and future operating costs were unaffordable, whilst hoping that the site could continue as an environmental hub for research, NGOs and consultants. If at all possible the FBA would like to maintain a presence at the site and have access to the river. The site will be disposed of, as a priority, in 2018-2019.

**THE FRESHWATER BIOLOGICAL ASSOCIATION  
DIRECTORS' REPORT FOR THE YEAR ENDED 31ST MARCH 2018  
(Continued)**

**Risk Management**

During the year the Directors reviewed the risks to which the Association is exposed and any changes were updated in the Association's Corporate Risk Register. This document approved by the Board of Directors is reviewed annually by the Board of Directors as part of its governance arrangements.

**Public Benefit Test**

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

**Trustees**

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

President

Prof. Sir John R Beddington CMG (to October 2017)  
Prof. Ann-Louise Heathwaite CBE (from October 2017)

Chairman of Council

Mr G.R. Bateman OBE

Honorary Treasurer

Mr R. A. W. Middleton

Representative Members

The Fishmongers' Company	Andrew Wallace (to October 2017)
Royal Society	Prof R Battarbee FRS (to October 2017)
	Prof K J Beven FRS (from October 2017)

Elected Members

\*Mrs F Bowles (to October 2017)  
\*Dr E Dollar (to October 2017)  
\*Dr I G Dunn (to October 2017)  
\* Co-opted members  
Prof S J Hawkins (to October 2017)  
Dr A Crowden  
Mr R Chadd (from October 2017)  
Prof G Woodward (from October 2017)

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      September 2018  
By Order of the Board

Mr G.R. Bateman OBE  
Chair of the Board

**THE FRESHWATER BIOLOGICAL ASSOCIATION**  
**STATEMENT OF FINANCIAL ACTIVITIES**  
**(INCLUDING INCOME AND EXPENDITURE ACCOUNT)**  
**FOR THE YEAR ENDED 31ST MARCH 2018**

	Note	Unrestricted Funds General	Other	Total 2018	Total 2017
		£	£	£	£
<b>Income:</b>					
Awards and donations	4	4,091	5,000	9,091	5,542
Activities for generating funds	5	305,664	-	305,664	221,731
Investment income & bank interest	6	13,972	-	13,972	28,922
		-----	-----	-----	-----
		323,727	5,000	328,727	256,195
<b>Income from charitable activities:</b>	7				
Membership services		24,913	-	24,913	26,128
Scientific publications and journals		27,513	-	27,513	77,704
Scientific research & activity		570,787	-	570,787	635,754
FBA Library/Data & Information Services		27,810	-	27,810	50,302
Training courses & meetings		41,659	-	41,659	47,540
		-----	-----	-----	-----
		692,682	-	692,682	837,428
		-----	-----	-----	-----
<b>Total income</b>		<b>1,016,409</b>	<b>5,000</b>	<b>1,021,409</b>	<b>1,093,623</b>
		-----	-----	-----	-----
<b>Expenditure</b>					
Cost of generating funds	8	314,113	-	314,113	482,306
<u>Costs of charitable activities:</u>	9				
Membership services		40,037	-	40,037	44,976
Scientific publications and journals		57,210	-	57,210	75,645
Scientific research activity and Grants		639,385	-	639,385	682,274
FBA library/Data & Information Services		93,347	-	93,347	174,800
Training courses and meetings		56,022	-	56,022	94,610
		-----	-----	-----	-----
Support costs	10	253,386	-	253,386	233,710
		-----	-----	-----	-----
<b>Total resources expended</b>		<b>1,453,500</b>	<b>-</b>	<b>1,453,500</b>	<b>1,788,321</b>
		-----	-----	-----	-----
Net (expenditure) for the year before transfers and other recognised gains/(losses)		<b>(437,091)</b>	<b>5,000</b>	<b>(432,091)</b>	<b>(694,698)</b>
Transfer between funds	17	2,617,904	(2,617,904)	-	-
Net gain on investments	13b	10,067	-	10,067	199,269
		-----	-----	-----	-----
<b>Net movement of funds in year</b>		<b>2,190,880</b>	<b>(2,612,904)</b>	<b>(422,024)</b>	<b>(495,429)</b>
<b>Reconciliation of funds</b>					
Total funds brought forward 2017		1,607,325	2,617,944	4,225,269	4,720,698
		-----	-----	-----	-----
Total funds carried forward 2018		3,798,205	5,040	3,803,245	4,225,269
		=====	=====	=====	=====

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 FRESHWATER BIOLOGICAL ASSOCIATION**  
**BALANCE SHEET AS AT 31ST MARCH 2018**  
**COMPANY NUMBER 263162**

	Note	2018		2017
		£	£	£
<b>Fixed Assets</b>				
Tangible	13a		3,267,864	3,184,047
Investments	13b		349,136	949,069
			-----	-----
			3,617,000	4,133,116
<b>Current Assets</b>				
Debtors and Prepayments	14	71,422		195,222
Cash at Bank and in Hand		189,992		160,359
			-----	-----
		261,414		355,581
<b>Less Current Liabilities</b>				
Creditors (due within 1 year)	15	(75,169)		(263,428)
			-----	-----
<b>Net Current Assets</b>			186,245	92,153
			-----	-----
<b>Total Assets Less Current Liabilities</b>			£ 3,803,245	£ 4,225,269
			=====	=====
<b>Representing Members' Funds</b>				
<b>Unrestricted</b>				
General Fund	16		3,444,714	1,246,324
Designated Funds	17		5,040	2,617,944
Revaluation Reserve	18		353,491	361,001
			-----	-----
			£ 3,803,245	£ 4,225,269
			=====	=====

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

Approved on behalf of Council by Mr G. R. Bateman OBE    Chair    September 2018

**THE FRESHWATER BIOLOGICAL ASSOCIATION**  
**CASHFLOW STATEMENT**  
**FOR THE YEAR ENDED 31ST MARCH 2018**

	<b>2018</b>	<b>2017</b>
	£	£
Net cash used in operating activities (See below)	(425,229)	(741,940)
Cash flow from investing activities:		
Investment income and bank Interest	13,972	28,922
Purchase of fixed assets	(166,525)	(874,489)
Proceeds from sale of investments	607,415	1,548,368
Change in cash and cash equivalent in the year	----- 29,633	----- (39,139)
Cash and cash equivalent brought forward	160,359	199,498
Cash and cash equivalent carried forward	----- £ 189,992 =====	----- £ 160,359 =====

Reconciliation of net movement in funds to net cash flow from operating activities

	<b>2018</b>	<b>2017</b>
	£	£
Net movement in funds	(422,024)	(495,429)
Add back depreciation charge	82,708	52,205
Add back Investment Management fees	2,585	2,395
Deduct Investment Income and bank interest	(13,972)	(28,922)
Deduct (gains)/add back losses on Investments	(10,067)	(199,269)
(Decrease)/increase in debtors	123,800	(55,723)
(Decrease) in creditors	(188,259)	(17,197)
Net cash used in operating activities	----- £ (425,229) =====	----- £ (741,940) =====

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

**1. Status**

The Association is a Company incorporated in England within the UK 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 Board of Directors who constitute honorary directors of the Association for Companies Act purposes manages the affairs of the Association. Details of the Board Members are given in the Directors' Report. The address of the registered office is The Ferry Landing, Far Sawrey, Ambleside, Cumbria, LA22 0LP.

**2. Accounting Policies**

(a) Basis of Preparation

The financial statements have been prepared in accordance with Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) (effective 1 January 2015) – (Charities SORP (FRS 102)), the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) and the Companies Act 2006.

The Freshwater Biological Association meets the definition of a public benefit entity under FRS 102. Assets and liabilities are initially recognised at historical cost or transaction value unless otherwise stated in the relevant accounting policy notes.

The company's functional and presentation currency is sterling rounded to the nearest pound.

(b) Preparation of the accounts on a going concern basis

The Association has an operating deficit of £432,091 for the year. The Board have taken immediate action to reduce the cost base of the FBA during this financial period. Future reductions in operating costs are planned and together with the current level of surplus Charity Funds, the Board consider that the Freshwater Biological Association is a going concern.

(c) Fund Accounting

The General Fund is made up of unrestricted funds, which are available for use at the discretion of the Directors 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 Directors of the Association for the furtherance of its activities by means of specific sponsorship.

(d) 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.

(e) 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.

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

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

Plant and Machinery over 5 – 20 years

Computer and Other Equipment (including Annexe furnishings) over 4 years

Scientific Equipment over 5-10 years

(f) 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.

(g) Investments

Investments are a form of basic financial instrument and are initially recognised at their transaction value and subsequently measure at their fair value as at the balance sheet date using the closing quoted market price. The statement of financial activities includes the net gains and losses arising on revaluation and disposals throughout the year.

The Association does not acquire put options, derivatives or other complex financial instruments.

The main form of financial risk faced by the Association is that of volatility in equity markets and investments markets due to wider economic conditions, the attitude of investors to investment risk, and changes in sentiment concerning equities and within particular sectors or sub sectors.

(h) Realised Gains and Losses

All gains and losses are taken to the Statement of Financial Activities as they arise. Realised gains and losses on investments are calculated as the difference between sales proceeds and their opening carrying value or their purchase value if acquired subsequent to the first day of the financial year. Unrealised gains and losses are calculated as the difference between the fair value at the year end and their carrying value, realised and unrealised investment gains and losses are combined in the Statement of Financial Activities.

(i) Pensions

The Association participates in Universities Superannuation Scheme. With effect from 1<sup>st</sup> October 2016, the scheme changed from a defined benefit only pension scheme to a hybrid pension scheme, providing defined benefits (for all members), as well as defined contribution benefits. The assets of the scheme are held in a separate trustee-administered fund. Because of the mutual nature of the scheme, the assets are not attributed to individual institutions and a scheme-wide contribution rate is set. The Association is therefore exposed to actuarial risks associated with the 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 Section 28 of FRS102 'Employee benefits', the Association therefore accounts for the scheme as if it were a wholly defined contribution scheme. As a result, the amount charged to the profit and loss account represents the contributions payable to the scheme.

(j) Redundancy Costs

Redundancy costs are charged to the Statement of Financial Activities in the period in which the Association has notified the affected employees.

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

**3. Net (outgoing) resources for the year**

This is stated after charging:

	<u>2018</u>	<u>2017</u>
	£	£
Depreciation	82,708	52,205
Auditors' remuneration	5,000	3,500
	=====	=====

	Unrestricted Funds		<u>2018</u>	<u>2017</u>
Incoming Resources	General	Other	£	£
	£	£		
<b>4. Awards and Donations</b>				
Membership donations	310	-	310	225
Legacies and other donations	1,281	5,000	6,281	2,949
Gift Aid	2,500	-	2,500	2,368
	-----	-----	-----	-----
	4,091	5,000	9,091	5,542
	-----	-----	-----	-----
<b>5. Activities for generating funds</b>				
Land and building income:				
Windermere (inc. annexe)	93,749	-	93,749	27,667
East Stoke	191,955	-	191,955	165,527
Windermere ferry contract	9,450	-	9,450	25,674
Miscellaneous income	10,510	-	10,510	2,863
	-----	-----	-----	-----
	305,664	-	305,664	221,731
	-----	-----	-----	-----
<b>6. Investment income</b>				
Bank deposit interest	132	-	132	603
Investment Income	13,840	-	13,840	28,319
	-----	-----	-----	-----
	13,972	-	13,972	28,922
	-----	-----	-----	-----
<b>7. Charitable activities</b>				
Membership services	24,913	-	24,913	26,128
Scientific and special publications	27,513	-	27,513	21,937
Journals	-	-	-	55,767
Research contracts	25,941	-	25,941	30,385
Scientific research & activity, direct funding and grants	544,846	-	544,846	605,369
Data & Information Services	27,772	-	27,772	47,062
FBA Library	38	-	38	3,240
Training courses and meetings	41,659	-	41,659	47,540
	-----	-----	-----	-----
	692,682	-	692,682	837,428
	-----	-----	-----	-----

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

<u>Resources Expended</u>	Unrestricted Funds		<u>2018</u>	<u>2017</u>
	<u>General</u>	<u>Other</u>		
	£	£	£	£
<b>8. Cost of generating funds</b>				
Land and buildings:				
Windermere	148,675	-	148,675	198,391
East Stoke	155,608	-	155,608	266,242
Windermere ferry contract	9,830	-	9,830	17,673
	-----	-----	-----	-----
	314,113	-	314,113	482,306
	-----	-----	-----	-----
<b>9. Cost of charitable activities</b>				
Membership services	40,037	-	40,037	44,976
Scientific and special publications	57,210	-	57,210	68,731
Journals	-	-	-	6,914
Research Contracts	49,326	-	49,326	5,257
Scientific research activity, direct funding and grants	575,288	-	575,288	677,017
Data & Information Services	78,198	-	78,198	166,717
The FBA library	-	-	-	8,083
Training courses and meetings	51,100	-	51,100	94,610
Redundancy Costs and fees	34,842	-	34,842	-
	-----	-----	-----	-----
	886,001	-	886,001	1,072,305
	-----	-----	-----	-----
<b>10. Support Costs</b>				
Council meetings and reimbursements to Trustees	10,794	-	10,794	10,317
Other costs – direct and indirect:				
Audit fees	5,000	-	5,000	3,500
Other professional fees	17,153	-	17,153	40,167
Staff costs	98,083	-	98,083	157,931
Redundancy Costs and fees	120,894	-	120,894	-
Irrecoverable VAT	1,462	-	1,462	21,795
	-----	-----	-----	-----
	253,386	-	253,386	233,710
	-----	-----	-----	-----

**11. Staff**

Average number of employees was 20 (16 FTE) paid employees (2017: 33 (25 FTE))

Total Staff Costs in the year were:	<u>2018</u>	<u>2017</u>
	£	£
Salaries	545,193	731,215
Employer's National Insurance Contributions	29,174	66,870
Employer's Pension contributions	73,681	47,499
	-----	-----
Total (including redundancy costs of £115,405)	648,048	845,584
	=====	=====

There were no employees in the remuneration band £60,000 to £69,999 or above (2017: None).

**12. Trustee Remuneration**

No members of the Board received any remuneration during the year. One member of the Board received an honorarium of £800 (2017: £800) for services as FBA Books Editor, unrelated to his/her position as a Director. Travel costs and Board expenses amounting to £10,794 (2017: £10,317) were paid for or reimbursed to 9 (2017: 9) members of the Board.

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

**13. Fixed Assets**(a) Tangible

	<u>Freehold Land &amp; Buildings</u>	<u>Plant &amp; Machinery</u>	<u>Computer and other Equipment</u>	<u>Scientific Equipment</u>	<u>Total</u>
	£	£	£	£	£
<u>Cost or Valuation</u>					
At 1st April 2017	2,854,164	347,071	174,392	26,034	3,401,661
Additions	141,411	25,114	-	-	166,525
Disposals	-	-	-	-	-
	-----	-----	-----	-----	-----
At 31st March 2018	2,995,575	372,185	174,392	26,034	3,568,186
	-----	-----	-----	-----	-----
<u>Accumulated Depreciation</u>					
As at 1st April 2017	47,682	17,354	126,544	26,034	217,614
Charge for the year	44,230	17,354	21,124	-	82,708
	-----	-----	-----	-----	-----
At 31st March 2018	91,912	34,708	147,668	26,034	300,322
	-----	-----	-----	-----	-----
Net book value					
At 31st March 2018	2,903,663	337,477	26,724	-	3,267,864
	=====	=====	=====	=====	=====
At 31st March 2017	2,806,482	329,717	47,848	-	3,184,047
	=====	=====	=====	=====	=====

The historical cost of Freehold Land & Buildings is £2,369,723 (2017: £2,228,312).

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 Board of Directors 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.

	£	<u>Quoted Investments</u>
		£
Market Value at 1st April 2017		949,069
Additions/(Disposals)		(607,415)
Investment Management fees		(2,585)
Net Investment (gains):		
Attributed to General Fund Account (Note 16)	10,067	
	-----	10,067
		-----
Market Value at 31st March 2018		349,136
		=====

During the year, £607,415 of capital has been raised by disposing of part of the M&G Charifund Income Fund and Accumulation Fund to assist with working capital requirements and the capital expenditure on the conversion of the Annexe. There have been no disposals from Investec funds.

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

**13. Fixed Assets (Cont)**

	<u>Quoted</u> <u>Investments</u> £
Represented by:	
Investments held on UK Stock Exchange	329,666
Cash held as part of Portfolio	19,470
	-----
	349,136
	=====

The accumulated units received during the year that were reinvested for capital growth had a cash value equivalent of £1,849 (2017: £49,449).

**14. Debtors**

	<u>2018</u> £	<u>2017</u> £
Trade Debtors	43,318	102,201
Other Debtors	12,150	20,127
Prepayments	15,037	19,286
VAT Debtor	917	53,608
	-----	-----
	71,422	195,222
	=====	=====

**15. Creditors**

PAYE, NIC and pension	7,294	26,502
Trade Creditors	27,023	162,833
Other Creditors and Accruals	27,161	48,134
Deferred income	13,691	25,959
	-----	-----
	75,169	263,428
	=====	=====

**16. General Fund Account**

	<u>2018</u> £	<u>2017</u> £
<u>General Fund Account</u>		
Balance brought forward	1,246,324	1,734,243
Net movement in funds before transfers and other recognised gains	(432,091)	(694,698)
	-----	-----
Transfer net movement to Other Funds (Notes 4 to 10)	814,233	1,039,545
	(5,000)	3,506
Unrealised gain/(loss) arising from revaluation of Investments (Note 13b)	10,067	199,269
Transfer from Revaluation Reserve (Note 18)	7,510	7,510
Transfer between Funds (Note 17)	2,617,904	(3,506)
	-----	-----
	3,444,714	1,246,324
	=====	=====

THE FRESHWATER BIOLOGICAL ASSOCIATION  
NOTES TO THE ACCOUNTS (Continued)

**17. Other Funds**

	<u>31.3.2017</u>	<u>Income</u>	<u>Expenditure</u>	<u>Transfers</u>	<u>31.3.2018</u>
	£	£	£	£	£
<u>Unrestricted Designated</u>					
Fritsch Fund	40	-	-	-	40
Frost Bequest	614,208	-	-	(614,208)	-
Frost Exhibition	3,696	-	-	(3,696)	-
Freshwater Science Fund	2,000,000	-	-	(2,000,000)	-
R I Webb Fund	-	5,000	-	-	5,000
	-----	-----	-----	-----	-----
<u>Total</u>	2,617,944	5,000	-	(2,617,904)	5,040
	=====	=====	=====	=====	=====

Unrestricted Designated Funds represents sums bequeathed, donated, or established by the Board to the Association for the furtherance of its charitable activities by means of specific sponsorship, but expendable at the discretion of the Board. At the October 2017 Board Meeting it was noted that the Freshwater Science Fund and the Frost Bequest Funds have effectively been utilised for General Funds and have now been transferred. The Funds are described briefly as:

Fritsch Fund – fund established to support the scientific collection of algal illustrations together with taxonomic references.

Frost Bequest – the fund was established from a bequest from the estate of Winifred Frost. The purpose of the fund is to provide income and interest to the Frost Exhibition Fund and represents the original capital sum and accumulated capital growth. An appropriate memorial will be organised when circumstances allow.

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.

Freshwater Science Fund – this fund was established by Council in order to support the attainment of the FBA's core charitable activities. This represented a long term commitment by the Association to the promotion of freshwater science but due to the present circumstances it has been transferred to the General Fund.

R I Webb – this fund was established in 2018 following a bequest of £5,000 received from Mr R I Webb, a Life member of 42 years. This fund to be used for research projects and for the provision of equipment and support for training.

<b>18. Revaluation Reserve</b>	£
Balance brought forward at 01.04.2017	361,001
Surplus on revaluation	-
Transfer to general fund – difference on historical cost depreciation charge and actual depreciation charge on the revalued amount	(7,510)
	-----
Balance carried forward at 31.03.2018	353,491
	=====

**19. Capital Commitments and Contingent Liabilities**

There were capital commitments of £22,161 (2017: £131,000) for the final retention fee for the conversion of the Ferry House Annexe, and no contingent liabilities at 31st March 2018.

**20. Taxation Status**

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

**21. Related Party Transactions**

There are no related party transactions.

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

**22. Pension Costs**

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 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 cost charged to the profit and loss account is £73,681 (2017: £47,499) as shown in note 11.

The latest available complete actuarial valuation of the USS Retirement Income Builder Section of the Scheme is at 31<sup>st</sup> March 2014 (the valuation date), which was carried out using the projected unit method. The valuation as at 31<sup>st</sup> March 2017 is underway but not yet completed.

Since the Association cannot identify its share of Retirement Income Builder Section of the scheme assets and liabilities, the following disclosures reflect those relevant for the scheme as a whole.

The 2014 valuation was the third valuation for USS under the scheme-specific funding regime introduced by the Pensions Act 2004, which requires schemes to adopt a statutory funding objective, which is to have sufficient and appropriate assets to cover their technical provisions. At the valuation date, the value of the assets of the scheme was £41.6 billion and the value of the scheme's technical provisions was £46.9 billion indicating a shortfall of £5.3 billion. These figures will be revised once the 2017 Scheme Valuation is complete.

Defined benefit liability numbers for the scheme for accounting purposes have been produced using the following assumptions as at 31<sup>st</sup> March 2017 and 2018.

	<b>2018</b>	<b>2017</b>
Discount rate	2.64%	2.57%
Pensionable salary growth	n/a	n/a
Pensions increases (CPI)	2.02%	2.41%

The main demographic assumption used relates to the mortality assumptions. These assumptions have been updated for the 31<sup>st</sup> March 2018 accounting position, based on updated analysis of the Scheme's experience carried out as part of the 2017 actuarial valuation. The mortality assumptions used in these figures are as follows:

	<b>2018</b>	<b>2017</b>
Mortality base table	<u>Pre-retirement:</u> 71% of AMC00 (duration 0) for males and 112% Of AFC00 (duration 0) for females.  <u>Post retirement:</u> 96.5% of SAPS S1NMA "light" for males and 101.3% of RFV00 for females.	98% of SAPS S1NA "light" YOB unadjusted for males.  99% of SAPS S1NA "light" YOB with a -1 year adjustment for females.
Future improvements to mortality	CMI_2016 with a smoothing parameter of 8.5 and a long term improvement rate of 1.8% pa for males and 1.6% for females.	CMI_2014 with a long term rate of 1.5% p.a.

The current life expectancies on retirement at age 65 are:

	<b>2018</b>	<b>2017</b>
Males currently aged 65 (years)	24.5	24.4
Females currently aged 65 (years)	26.0	26.6
Males currently aged 45 (years)	26.5	26.5
Females currently aged 45 (years)	27.8	29.0

	<b>2018</b>	<b>2017</b>
Scheme assets	£63.6bn	£60.0bn
Total scheme liabilities	£72.0bn	£77.5bn
FRS 102 total scheme deficit	£8.4bn	£17.5bn
FRS 102 total funding level	88%	77%

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

### **Opinion**

We have audited the financial statements of The Freshwater Biological Association for the year ended 31st March 2018 which comprise the primary statements such as the Income and Expenditure Account, the Balance Sheet, the Statement of Financial Activities, the Cash Flow Statement and the related notes. The financial reporting framework that has been applied in their preparation is applicable law and (United Kingdom Generally Accepted Accounting Practice) including FRS 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland (United Kingdom Generally Accepted Accounting Practice).

This report is made solely to the Associations 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 charitable Associations 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 charitable company and its members as a body, for our audit work, for this report, or for the opinions we have formed.

In our opinion the financial statements:

- give a true and fair view of the state of the charitable company's affairs as at 31st March 2018 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;
- have been prepared in accordance with the requirements of the Companies Act 2006.

### **Basis for opinion**

We conducted our audit in accordance with International Standards on Auditing (UK) (ISAs (UK)) and applicable law. Our responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the financial statements section of our report. We are independent of the charitable company in accordance with the ethical requirements that are relevant to our audit of the financial statements in the UK, including the FRC's Ethical Standard, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

### **Conclusions relating to going concern**

We have nothing to report in respect of the following matters in relation to which the ISAs (UK) require us to report to you where:

- the trustees' use of the going concern basis of accounting in the preparation of the financial statements is not appropriate; or
- the trustees have not disclosed in the financial statements any identified material uncertainties that may cast significant doubt about the charitable company's ability to continue to adopt the going concern basis of accounting for a period of at least twelve months from the date when the financial statements are authorised for issue.

### **Other information**

The trustees are responsible for the other information. The other information comprises the information included in the trustees' report, other than the financial statements and our auditor's report thereon. Our opinion on the financial statements does not cover the other information and, except to the extent otherwise explicitly stated in our report, we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated. If we identify such material inconsistencies or apparent material misstatements, we are required to determine whether there is a material misstatement in the financial statements or a material misstatement of the other information. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

**INDEPENDENT AUDITORS' REPORT TO THE MEMBERS OF  
THE FRESHWATER BIOLOGICAL ASSOCIATION  
(Continued)**

**Opinions on other matters prescribed by the Companies Act 2006**

In our opinion, based on the work undertaken in the course of the audit:

- the information given in the trustees' report (incorporating the directors' report) for the financial year for which the financial statements are prepared is consistent with the financial statements; and
- the directors' report has been prepared in accordance with applicable legal requirements.

**Matters on which we are required to report by exception**

In the light of our knowledge and understanding of the charitable company and its environment obtained in the course of the audit, we have not identified material misstatements in the directors' report.

We have nothing to report in respect of the following matters in relation to which 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 directors' 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' exemptions in preparing the directors' report and from the requirement to prepare a strategic report.

**Responsibilities of trustees**

As explained more fully in the Trustees' Responsibilities Statement set out on page 1 the Trustees (who are also the directors of the charitable company for the purposes of the company law) are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view, and for such internal control as the trustees determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the trustees are responsible for assessing the charitable company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the trustees either intend to liquidate the charitable company or to cease operations, or have no realistic alternative but to do so.

**Auditor's responsibilities for the audit of the financial statements**

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with ISAs (UK) will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

A further description of our responsibilities for the audit of the financial statements is located on the Financial Reporting Council's website at: [www.frc.org.uk/auditorsresponsibilities](http://www.frc.org.uk/auditorsresponsibilities). This description forms part of our auditor's report.

First Floor, Shropshire House  
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London W1T 7NZ  
September 2018

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