



fsbi

An International Society for Fish Biology

Summer 2018

The Society awards three medals each year for outstanding work on fish biology, conservation and management. Here are the three winners for 2018.

The Le Cren medal, which recognises outstanding work in conservation, education and outreach, is awarded to Amanda Vincent who is at the Institute for the Oceans and Fisheries, The University of British Columbia, Vancouver Canada.

Professor Amanda Vincent has been awarded the Le Cren medal for her lifelong contributions to the understanding of fish biology and in particular seahorse ecology. Her outstanding work on seahorse conservation, as well as her work on the training of collaborators and



her contributions to the public understanding of conservation issues has been noteworthy.

Amanda did a PhD on the reproductive ecology of seahorses, at the University of Cambridge University UK (1990), in Tim Clutton Brock's group. She then went on to

Uppsala where she did a postdoc (and learnt some Swedish). Her work demonstrated the global threats to seahorse populations through trade and habitat destruction. As a result of this Amanda cofounded Project Seahorse (in 1996), which she is now the director of. Project Seahorse is a collaborative, influential and international organization. Amanda Vincent and her team work to pursue research and

management for conservation and sustainable use of coastal marine ecosystems. Her group undertakes fish biological research, carries out social research leading to the empowerment of local communities, helps to establish marine protected areas, contributes to policy development and has a special responsibility for species conservation within the IUCN framework.

The group has a strong programme in public understanding of conservation issues (see <http://www.projectseahorse.org/get-involved/>). Amanda's dedicated and powerful work on conservation and the sustainable use of marine fish and fisheries is outstanding. Her scientific productivity is high and many papers have a very significant impact. Her activities at meetings and conferences are always notable and she is a key figure in the world of syngnathid research and in marine conservation in general. ➤



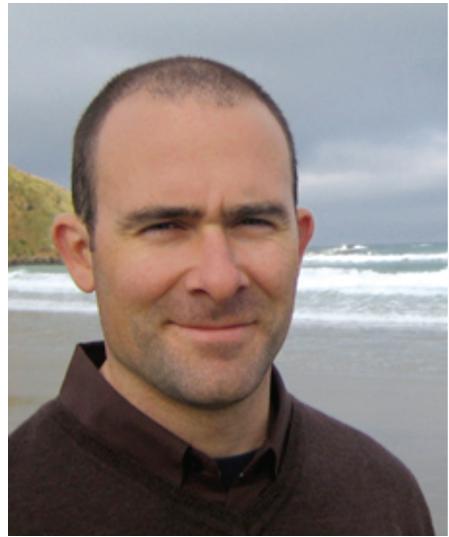
The Beverton medal, awarded for a life time's contribution to fish biology, has been awarded to Gary Carvalho, School of Biological Sciences, Bangor University, UK.

Professor Carvalho has an impressive record of pushing the boundaries of science throughout his career. Since his early days, he has been at the forefront in studying the demography and population structure of wild fish populations by applying molecular genetic approaches. Using carefully selected biological systems, he demonstrated not only the power of molecular markers in fish biology, but also in applied fisheries science. Some of his studies are now classical papers in the fishery literature, dispelling the then held beliefs on large, unstructured marine fish populations that are slow to react to environmental pressures and exploitation. For example, his work on European anchovies, Atlantic cod and Atlantic herring showed fine scale population structure, that have immediate and important application for the management of the species. Projects on New Zealand snapper, guppies and cod revealed rapid genetic changes in exploited populations and remain Gary's most cited articles demonstrating rapid evolution in overexploited stocks.

Gary always aimed to use these new insights to improve management and so sought to engage with fishery manager, policy makers and agencies, so ensuring immediate applicability of his research. This integration of molecular genetic research with applied problems in management are now a common aim of molecular ecologists, but Gary was one of the scientists to spearhead this development. This work quickly allowed him to establish a leadership role in European fisheries genetics that he has occupied from the early days of his career. His skills in bringing and holding together groups of very disparate scientists allowed him to use a highly interdisciplinary approach in his projects, which is particularly apparent in his coordination of large EU funded projects, for example, a recent project specifically addressing the traceability of fish products to their population of origin (FISHPOPTRACE). This highly successful project is used worldwide as an example of an interdisciplinary team addressing a very applied problem with advanced genetic technology, in this case using genomic variation in marine fish to identify the origin of illegal catches.

Gary has established large successful research groups at the Universities of Swansea, Hull and now Bangor, each of which represented a supportive environment for its members and visitors. Many of his students have become successful scientists, continuing his legacy of interdisciplinary research in applied fisheries contexts.

The FSBI medal which goes to a researcher who is in early to mid career, is awarded for 2018 to Aaron MacNeil, Department of Biology, Dalhousie University, Halifax, Canada.



Aaron MacNeil did his first degree at Dalhousie University but came to the UK to do a PhD under the supervision of Nick Polunin (one time Vice President of the FSBI). From Newcastle he went on to a post-doctoral position with NOAA before becoming a research scientist at the Australian Institute of Marine Science, Townsville. In 2017 he started a faculty job at Dalhousie University, Canada as an associate professor and Canadian Research Chair in fisheries science. Aaron's research into fish and fisheries includes trophic ecology, ecosystem based fisheries management, and ecosystem functioning. He has developed highly accomplished Bayesian modelling skills, and is rapidly becoming one of the leading quantitative marine ecologists tackling fish biology and fisheries science. Dr MacNeil has been consistently publishing in the world's leading journals, including 3 papers in *Nature*, 3 in *PNAS*, 3 in *Ecology Letters*, and 2 in *Current Biology*. Many of his papers are ISI highly cited, have attracted a great deal of media interest. His citations are rapidly climbing, with >3,400 citations to date (>700 in 2017 alone), and Aaron has an *h*-index of 30 (Google Scholar). Among Aaron's research achievements, are his work on 1) rebuilding fisheries toward functional baselines (MacNeil et al. 2015 *Nature*) so supporting ➤

◀ ecosystem resilience; 2) the biology and trophic scaling of sharks, and 3) investigating fisher behaviour and socio-economic characteristics to better inform fisheries management. Aaron often takes leading roles in major collaborations and initiatives, and communicates his science broadly. He is currently one of the lead PI's on the global FinPrint project, which is assessing global coastal shark abundance and composition. Through his role with the Australian Institute of Marine Science, an Australian government institution, he regularly contributed to policy documents and recommendations. He has given a variety of invited talks, including to a UK Royal Society discussion meeting, and a session plenary at the European Coral Reef Symposium in Oxford (2017). Aaron

will continue to be a productive and world leading fisheries science researcher, cementing a significant international reputation.

The internet is a wonderful tool. During my search for a picture of Aaron I came across an article about him when he was a masters student at the University of Georgia. Apart from a description of his masters project Aaron was asked a number of subsidiary questions which I can't resist repeating. I hope he will not be offended (Ed).

When I have free time, I like...

...reading at the Hot Corner, hiking in the Georgia mountains, spending time on the coast, shopping for used books, and taking photographs.

The craziest thing I've done is...

...live in the South!

My favorite professor is...

...Gene Helfman. He is a genuine and inspiring person who knows a lot about life and how to live it. If you have a free course, take Ichthyology from him.

If I could share an afternoon with anyone, I would love to share it with...

...William Shatner. He has somehow managed to be both inside and outside American culture for the last 40 years. His new album has something important to say to us—I'm just not sure what it is.

The one UGA experience I will always remember will be...

...going to UGA football games and seeing grown men wearing red pants in public. I am still in disbelief.

Editorial

At the April Council meeting the issue of GDPR raised its (ugly?) head. GDPR stands for General Data Protection Regulation and as might be expected if you live in Europe, it emanates from the European Union. For members living in the UK the introduction of this set of regulations, which come into force on 25th May will have been evident by the bombardment of your inbox by emails asking for you to give organisations permission to send you what they have been sending you before. If you don't sign up then you might escape unwanted adverts although it won't stop the bots sending out their rubbish. The Society is going to have to cope with this regulation too so expect some emails asking you to consent to the FSBI sending you stuff.

It so happens that I am also reading at this time a new book by David Sumpter a one-time collaborator. He is a mathematician working at Uppsala University in Sweden and he spends quite a bit of time

producing models and analyses of group behaviour in fish birds and other animals, hence my connection with him. David has written a book called *Outnumbered* which describes, explains and analyses all the algorithms that are used by almost every organisation one interacts with these days; Facebook, Google, the National Health Service (in the UK), banks and other businesses. As yet I don't think that the FSBI has any algorithms directing its affairs.

David's book is a clear and fascinating insight into how these organisations use algorithms to find out what you do and don't like, what you think about political issues and whether or not you are in the right group for screening for bowel cancer. My general impression is that despite all the furore over Cambridge Analytica and its use of Facebook data (which is discussed in this book), these algorithms are not as threatening as the media make out. At best they allow organisations to be more efficient

and to do things they could not do if human processors were relied on. At worst they can lead to the blind bureaucratic processes that lead to individuals being unjustly expelled from their country of residence (e.g. the Windrush scandal in the UK) or they can misapply information leading to groups of people missing vital check-ups (e.g. breast cancer screening for older women in the UK). There is some evidence that apps such as Twitter can lead to the formation of so-called echo-chambers where people only hear views that agree with their own, but the evidence indicates that even these are not 'sound tight'. I can recommend the book to all who'd like a clear analysis of the algorithms that affect us in so many ways and to give a better understanding of how the facilities on the internet affect us for good or evil.

Paul Hart
Leicester, May 2018
Next deadline: 1st August 2018

Iain Barber, Society President writes

I am writing this after a particularly busy and full Spring Council meeting, at which we discussed a number of matters that will be critical to the long-term direction and security of the FSBI. In these next few lines I would like to share with you some of the major issues that we have been dealing with. As ever, I am most grateful to my fellow officers, members and guests of Council for their wisdom, expertise and support, and for all the time they devote to ensuring the Society runs efficiently and effectively.

One of the most important of these matters is the renegotiation of the contract to publish the *Journal of Fish Biology*. The great majority of the Society's income – and hence the basis for almost all of our support for fish biology and fisheries science research – arises from our publishing contract, so with the current contract due to expire at the end of the year, ensuring we secure an appropriate financial arrangement for the future is essential to safeguarding the work of the FSBI. I am pleased to say that negotiations have proceeded well, and are now at an advanced stage; I hope to bring you good news in the very near future!

We also discussed in depth the current composition and structure of Council, particularly with respect to existing committee structures. Council forms committees to look after the various aspects of the Society's business, and we currently have committees overseeing our research grants, travel grants, studentships and publications. Each Council member serves on one or more of these committees, with the financial committee comprising the President, Treasurer and Secretary. At last year's AGM we were mandated by the membership to expand Council, and this is something we would

now like to do. For a while, we have been considering convening a Communications committee, which would bring together all of our externally-facing activity, and so this summer we will use the opportunity to bring on board a number of new Council members to enable this. If you have particular interest or expertise in science communication, perhaps you would like to consider putting yourself forward? We would be delighted to receive applications from any member of the Society, including student members, who are also now eligible to sit on Council.

A third critically important aspect of our current work is the redevelopment of our website, which is long overdue. We have been working on our new website with BoldLight (<http://boldlight.co.uk/>), an experienced web development company with particular expertise in the academic and charity sector (they have recently worked with the RSPB, Alzheimer's Research UK, Kidney Research UK and the British Society for Parasitology). The site is now nearing completion, and at Council we reviewed the latest draft version. We are very excited about the far greater utility the new website will bring to our membership, including a secure members area, greater ease of access to the *Journal*, and a simplified grant application system, as well as a fresher overall look and a state of the art technical platform. We expect to be rolling out the new website to coincide with our Symposium in July.

You will no doubt have read in this newsletter about our 2018 medal winners, and hopefully will have also seen our tweets or Facebook posts announcing these. We are delighted to award our medals this year to such outstanding scientists, and also

pleased that all three medallists will be attending the FSBI International Symposium at UEA in July to receive their awards. I look forward to welcoming them, and hopefully many of you, to what looks to be another fantastic conference.

Finally, I'm sure that, like me, you will have been inundated recently with email or paper requests for you to give your consent to renewed privacy policies from every organisation, website or business that you have ever interacted with. The reason for this is that European data protection laws have recently changed to place greater demands on any organisation that holds personal data, and all such organisations are required to be compliant with the new General Data Protection Regulation (GDPR). To this end, and with much guidance from our legal advisors, we have been reviewing the FSBI's data handling processes, data retention policies and procedures, and as a result we have updated our Privacy Policy, which will soon be available on the website. In addition, we have recently contacted our members by email for the essential consent that we require in order to continue our contact with you beyond 25th May 2018. **If you have not yet responded to this request to consent, please can I ask you to do so immediately!** If you have not received the email request, or if you have lost the original email, then please contact our membership administrator directly by email (Shirley.Robinson@brabners.com).

Wishing you a great late Spring and early Summer!

With very best wishes,

**Iain Barber
Honorary President**

Research grant report



Rohan Brooker, University of Saskatchewan, Canada reports on an FSBI research grant which was titled '*Coastal development inhibits fish recruitment by altering plant-associated settlement cues*'.

Plant-derived chemicals can provide important settlement cues for larval fishes, orientating them

towards shallow water habitats near land. However, coastal plant communities are increasingly under pressure from development and associated pollution. As a result, human activities that change the composition and health of these communities could subsequently alter the availability of key olfactory cues. In the tropics, mangrove communities are a ubiquitous component of both mainland and island coastal ecosystems, often growing adjacent to fringing coral reefs where conditions are suitable. As mangrove leaf fall often peaks during periods of highest fish recruitment, odorous chemicals released from decaying mangrove leaves may represent an important source of settlement cues. In this study, both Caribbean and Indo-Pacific reef fishes displayed an acute ability to distinguish between leaf odours from undeveloped

and developed areas. Chemical and microbial analysis of leaf tissue revealed significantly higher levels of toxic metals, such as copper found in anti-fouling paint and treated timber, in leaves from the developed site, as well as differences in the microbial film composition, suggesting concentrations of assimilated pollutants may be responsible for the behavioural differences observed. When tested using patch reefs, the different sources of leaves directly affected subsequent recruitment, with settlement highest on patch reefs paired with undeveloped island leaf odour and lowest to those paired with the odour of developed island leaves. This could reflect the different levels of toxic metals observed, with settlement significantly lower on patch reefs paired with isolated compounds.

Book review

ZEBRAFISH: METHODS AND PROTOCOLS. SECOND EDITION.
By K. Kawakami, E. E. Patton & M. Orger (Eds). 373 pp.
Published by Humana Press, Springer, Heidelberg, Germany, 2016. Price £82.00.
ISBN: 978-1-4939-3769-1.



The zebrafish (*Danio rerio*) has come a very long way since the 1970s, when the late George Streisinger at the University of Oregon, U.S.A., first constructed the framework that would make

this diminutive minnow from the streams and rice paddies of India and Bangladesh a laboratory model organism for vertebrate development. Even the most ardent proponents of Streisinger's vision could not have imagined just how successful a venture that this would prove to be; the zebrafish is now virtually ubiquitous in research, a piscine version of the fruit fly, or better yet, the venerable and all powerful laboratory mouse. Indeed, the zebrafish system has led to make significant discoveries in genetics, developmental biology, and human disease, and is will be a major force in biomedicine for the next decade and beyond.

This is the backdrop for the present book, which is the second

edition of what was originally published as a popular collection of methods and protocols written by leading scientists in the zebrafish research community in 2009 (Lieschke, G. J., Oates, A. C. & Kawakami, K. (Eds) (2009). Zebrafish: Methods and Protocols. Heidelberg, Germany: Humana Press, Springer). While that version focused on methods of genetic modification in the fish, its successor is partitioned into three sections: genetics and genomics, human disease modelling, and neuroscience. This reflects the fact that zebrafish research, of any kind, is still driven by the ever-increasing array of tools that are being developed to annotate and manipulate their genome, and highlights two of the disciplines

◀ in which the model system is experiencing the greatest growth.

The book opens with chapters that outline how some of the most prominent genetic tools currently revolutionizing biomedicine, most notably the CRISPR-Cas9 system, are employed in the zebrafish model. It also covers other important genomic editing technologies/approaches, including TALENS, site directed genetic integration, and chemical screening. The remainder of the book showcases how scientists are leveraging these tools, along with the innate features of the zebrafish itself, to study human disease and neuroscience. The disease modelling section highlights zebrafish models of cancer, cardiac regeneration, lipid metabolism, stem-cell biology, and immune function. The final section on neuroscience introduces the reader to the array of techniques that are increasingly being employed in the zebrafish system to study neural circuitry and function. This includes the treatment of a diverse set of protocols that range from the labelling, imaging,

and manipulation of neurons in the fish brain, to the use of laser microsurgery to study axonal regeneration and calcium imaging of brain activity in free swimming larvae.

While there is little question that this book will serve as a ‘go-to’ resource for those in the biomedical research community who either already work with the zebrafish or plan to do so in future studies, most readers of this newsletter may not immediately recognize the value of this volume for their respective fields. However, there are so many incredible things being done with the zebrafish in science that it would be folly for any fish biologist not to pay attention to what is occurring on this front. The simple fact of the matter is that the zebrafish is a powerful tool that can be used in a wide number of scientific disciplines, including some near and dear to those who study fish for reasons other than to understand human biology and disease.

The zebrafish experimental system and its ever-expanding collection of tools and techniques

have great potential to further scientific knowledge of other fish species. Many of the same protocols and techniques first developed and then refined in the zebrafish can be extended to other fish species, and used to study various aspects of their biology and behaviour. And at the same time, if the zebrafish can be successfully employed as a model of human biology and disease, it can and should be an even better model for other fishes. This latter point has particular relevance for the fields of fish disease, commercial aquaculture, nutrition, and behaviour.

For these reasons, I recommend that anyone working in any capacity with fishes take a closer look at this book. It serves both as a valuable reference for the scientists already familiar with the zebrafish, and an excellent and illuminating introduction to those who are not.

Christian Lawrence
Boston Children’s Hospital,
Boston, MA, U.S.A

Notes from Council 25th April 2018

FSBI Symposium 9th-13th July 2018 at the University of East Anglia. This conference, entitled: *The sustainable use and exploitation of fishes*, is still open for registration although you have missed the early bird deadline. Don’t forget that the conference

organisers are also running a photographic competition – see the FSBI website for details.

After the conference there will be a public activity over the weekend (14th/15th July) and John Pinnegar and Martin Taylor will be running a display. If you have

anything fishy that you think might be useful then please contact John (john.pinnegar@cefas.co.uk) or Martin (martin.taylor@uea.ac.uk).

See Iain Barber’s article for more news of Council activities.

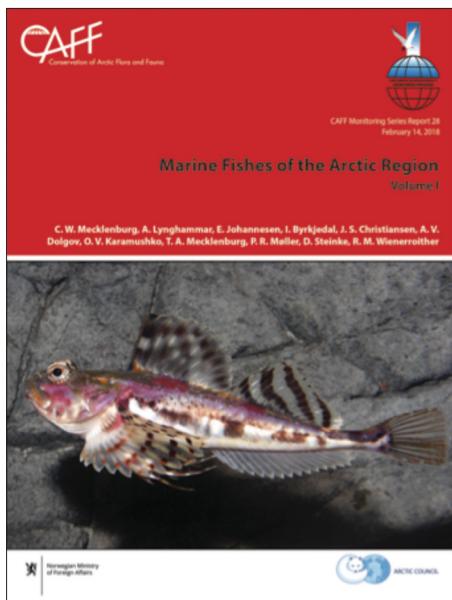
Notices

THE SOCIETY’S ANNUAL GENERAL MEETING WILL BE AT 12.00 ON WEDNESDAY 11 JULY 2018 IN ROOM 0.16 LECTURE THEATRE, THE ENTERPRISE CENTRE, NORWICH RESEARCH PARK, UNIVERSITY OF EAST ANGLIA, UNIVERSITY DRIVE, NORWICH, NR4 7TJ

NOMINATIONS TO COUNCIL. There are four places available on Council. If you would like to contribute to the work of the Society then send your name to Ian Winfield at secretary@fsbi.org.uk before 25th May 2018.



The following book is now available



The publisher says:

Marine Fishes of the Arctic Region is intended for all who do research in and monitoring of marine ecosystems in the Arctic. It presents accounts for 205 species with maps of global distribution and descriptions of morphology and habitat, as well as a photographic identification guide.



Information on 24 other species present only in the fringes of the Arctic Region or taxonomically problematic is given in the introductions to the fish families.

As the Arctic continues to warm, more cold-temperate species are expected to enter the region and the distribution of true Arctic species will likely retract as

the area of ice-covered cold water shrinks. The maps in the *Marine Fishes of the Arctic Region* can be used to compare future changes in distributions. The identification guide will be particularly helpful for identifying cold-water species, since fewer identification tools are available for this group of fishes.

The *Marine Fishes of the Arctic Region* is freely available on our website in two volumes. Volume 1 includes maps and species accounts with species descriptions, while Volume 2 includes photo identification guides of the species:

Marine Fishes of the Arctic Region Volume 1:

<https://caff.is/marine/marine-monitoring-publications/451-marine-fishes-of-the-arctic-region-vol-1>

Marine Fishes of the Arctic Region Volume 2:

<https://caff.is/marine/marine-monitoring-publications/452-marine-fishes-of-the-arctic-region-vol-2>

Journal of Fish Biology Special Issue on The Biology and Ecology of African Freshwater Fishes

Olaf LF Weyl and Albert Chakona

South African Institute for Aquatic Biodiversity

Ian Harrison

Conservation International;
FFSG Technical Assistant

The freshwater ecosystems of Africa are rich in fishes and include many different habitats, such as underground systems, desert springs and pools, rivers and estuaries, and lakes ranging from very small to very large and deep. African freshwater fishes, which range in size from some of

the smallest species of fishes, to some of the largest, represent a diverse and important component of the ecology and food webs of many different ecosystems whose assemblages in rivers, reservoirs and lakes are considered an important source of food security and livelihoods.

Despite the diversity of fishes in Africa (currently 3367 species in the Ethiopian Zoogeographic realm), and their ecological and socio-economic importance, our knowledge of them is relatively poor. IUCN's *Red List of Threatened Species* found that over 500 species (18% of those assessed) were Data Deficient, with insufficient information

on their taxonomy, ecology, or distribution to assess whether they are threatened or not (Snoeks *et al.*, 2011). As societal concern about global biodiversity increases, there is an urgent need to gain a better understanding of the taxonomy, biology, ecology, diversity and distribution of African freshwater fishes, before they and their habitats are compromised or completely lost.

Consequently, the purpose of this Special Issue of the *Journal of Fish Biology* is to assemble new information on African freshwater fishes, spanning all continental Africa, Madagascar, and other small islands around Africa. Papers reporting new scientific ➤

◀ research and fieldwork that supplies novel information on the biology, ecology and distribution of African freshwater fishes are welcome. We are also interested in taxonomic descriptions and revisions. Reports on new records of species may also be considered, but these records must be important in terms of representing a significant increase in the known range of the species, or must address new information on some other important aspect of the species' biology and ecology. Review papers that synthesize existing knowledge on fish fauna and present them in a way that brings new insight to the topic are welcome. Papers that focus primarily on fisheries management and aquaculture, rather than fish biology, do not fit the scope of this Special Issue.

Please consult the *Journal of Fish Biology* website, and check previous Special Issues to obtain more information about the expected scope and style of manuscripts in these

issues. The Journal web site is at: [http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1095-8649](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1095-8649).

Expected timeframe for production

31st October 2018

Deadline for submission of draft manuscripts

February 2019

Complete review of submitted manuscripts

September 2019

Expected publication date

References

Snoeks, J., Harrison, I.J. & Stiassny, M.L.J. (2011). The status and distribution of freshwater fishes. In *The Diversity of Life in African Freshwaters: Under Water, Under Threat. An analysis of the status and distribution of freshwater species throughout mainland Africa* (Darwall, W., Smith, K., Allen, D., Holland, R. & Brooks. E., eds). pp. 42-73. Gland, Switzerland & Cambridge, U.K: IUCN.

Information Desk

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

FSBI, c/o Charity & Social Enterprise Department, Brabners, Horton House, Exchange Flags, Liverpool L2 3YL, UK

Contact: Shirley Robinson

Phone: +44 (0) 151 600 3362

Email Enquiries: grants@fsbi.org.uk

In the UK and Europe subscription enquiries should be addressed to:

admin@fsbi.org.uk Charities and Social Enterprise Department, Brabners, Chaffe Street, Horton House, Exchange Flags, Liverpool L2 3YL

Tel: 0151 600 3000 (ext. 3362)

Fax: 0151 227 3185

See <http://www.fsbi.org.uk/membership/joining-the-fsbi/> for further information.

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