

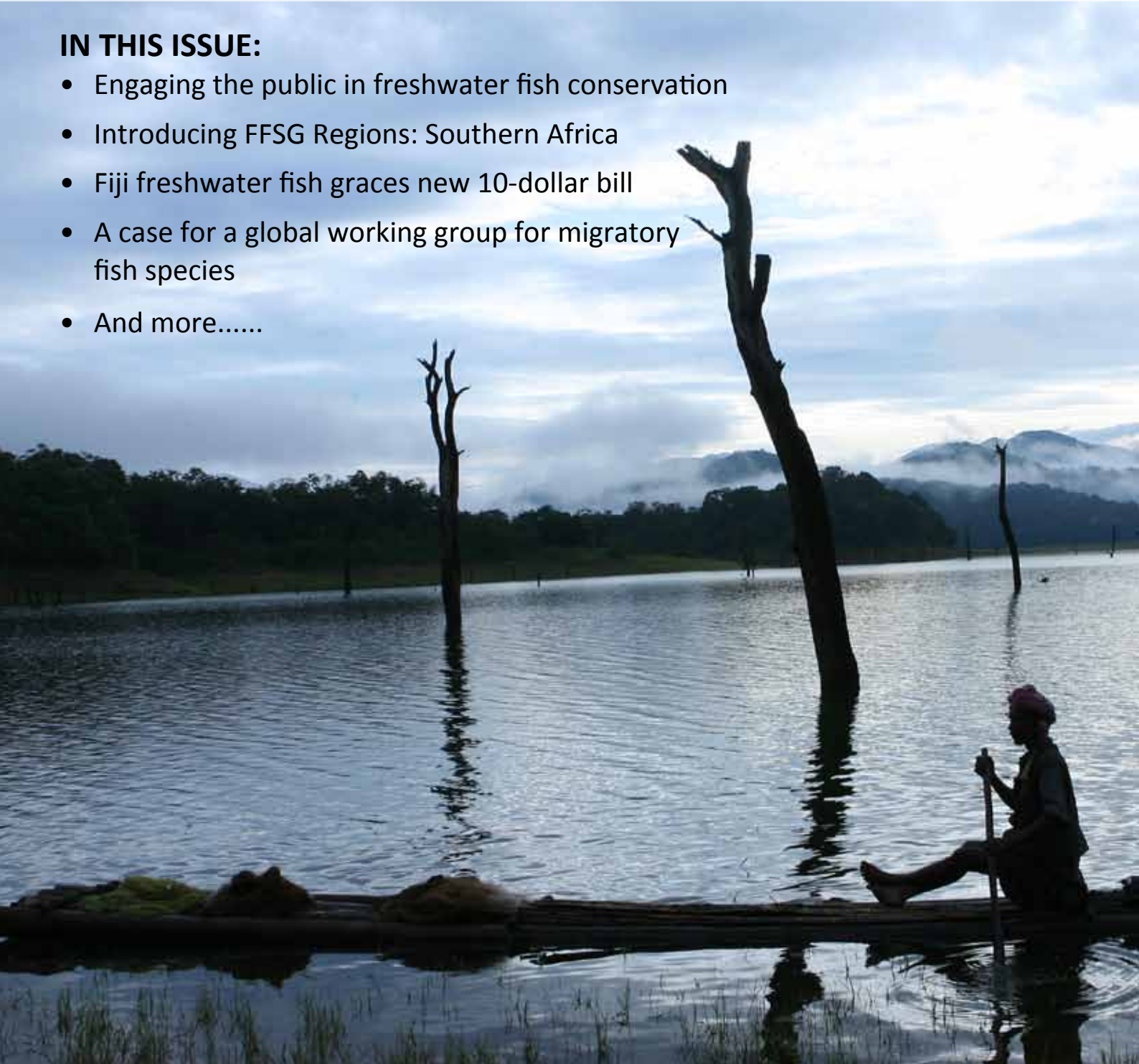
SAVING FRESHWATER FISHES AND HABITATS

Newsletter of the IUCN SSC/WI Freshwater Fish Specialist Group

Issue 2 • June 2013

IN THIS ISSUE:

- Engaging the public in freshwater fish conservation
- Introducing FFSG Regions: Southern Africa
- Fiji freshwater fish graces new 10-dollar bill
- A case for a global working group for migratory fish species
- And more.....





Freshwater Fish Specialist Group

Freshwater fishes sustained in their natural environments

CONTENTS

FFSG UPDATE

- 3 Message from the FFSG Global Chair
- 4 Save the date: FFSG Annual Meeting 2014
- 4 WANTED: High quality images for FFSG website
- 5 Bridging the gap: Engaging the public in freshwater fish conservation
by Suzanne Turnock and Michele Thieme
- 7 Introducing FFSG Regions: Southern Africa
by Paul Skelton

NEWS FROM AROUND THE WORLD

- 10 Fiji freshwater fish graces new 10-dollar bill: Bringing freshwater fish into the popular consciousness
by Aaron P. Jenkins
- 12 Activities of the South Asia Office of the Freshwater Fish Specialist Group (September 2012 to April 2013)
by Rajeev Raghavan
- 14 Towards an 'Exotic Fish' Free Periyar Tiger Reserve
by Kaimal Krishnakumar and Rajeev Raghavan
- 16 New fish species described in 2012-2013 from South Asia
by Waikhom Vishwanath
- 21 First comprehensive Red List workshop for all freshwater fishes of the Middle East
by Jörg Freyhof
- 23 Kinabatangan River Spirit Initiative, Malaysia
by Tun-Min Poh and Suzanne Turnock

OPINION

- 25 The case for establishing a global working group for the conservation of freshwater migratory fish species
by Claudio Baigún, Zeb Hogan and Taej Mundkur

Editor-in-chief
Gordon McGregor Reid

Editor
Suzanne Turnock

Design
Suzanne Turnock and
Katalin Csatadi

Front cover photograph
Local fisherman in the
Periyar Tiger Reserve,
India.
© Rajeev Raghavan

Message from the FFSG Global Chair

Professor Gordon McGregor Reid



Peering into the future, Albert Einstein is quoted as saying “I fear the day that technology will surpass our human interaction. The world will have a generation of idiots.” Well perhaps that day has actually arrived? We are now in the age of the internet with super-high speed communications on all sorts of issues. Does this make us better-informed, wiser and more effective? On balance I think so, at least in the area of freshwater fish conservation.

There is now a wealth of electronic material in circulation, available on a daily basis via the FFSG, Wetlands International and many other sources. This material is designed to provoke, to stimulate, to inform; and to discuss and take action on. Surely that has to be a good thing? To assist this global process, there is a great need for high quality images for the FFSG website, so do please respond to our appeal in this newsletter, if you can assist. Such images help make for better communications with the public, as proposed here by Suzanne Turnock and Michele Thieme.

Many FFSG Members are scientists, but in order to bring about effective conservation we need to interact well outside the scientific community. Aaron Jenkins highlights the popularisation of fishes with the public via an image on a new banknote in Fiji. There is no end to the means by which we can get our conservation message out!

The global zoo and aquarium community represents a very large target audience, numbering many millions. WAZA is currently selecting species to publicize widely for its celebration of a Decade of Biodiversity. They are seeking examples of threatened freshwater fish species for inclusion, with brief indications of what is required to support their conservation. If you can help, please contact WAZA Director Gerald Dick (gerald.dick@waza.org).

Many thanks to all our authors for their excellent contributions to our newsletter. Please keep them coming!

Gordon McGregor Reid



You can sign up online [here](#) to become a member of the IUCN SSC/ WI Freshwater Fish Specialist Group!



[Click here](#) to join us on Facebook for news on freshwater fish conservation!



For information contact: Suzanne Turnock (FFSG Programme Officer), at s.turnock@chesterzoo.org

WANTED: High quality images for FFSG website

We are currently developing the FFSG website and desperately need high quality images for use on the website. The types of images we are looking for are:

- Freshwater fishes in their natural environments
- Natural habitats
- Research projects (e.g. data collection, surveys)
- Community involvement
- Workshop/conferences relating to freshwater fish conservation
- Examples of major threats to freshwater fishes



If you have any photograph(s) you would be happy for us to use on the website please email them, with captions, to s.turnock@chesterzoo.org. Please clearly state in the email that you give permission for FFSG to use your photographs.

All photographs will be fully credited on the website.

Bridging the gap: Engaging the public in freshwater fish conservation

Suzanne Turnock¹ and Michele Thieme²

¹FFSG Programme Officer; ²Senior Freshwater Conservation Biologist, Conservation Science Program, World Wildlife Fund-US.

Following in the footsteps of other IUCN SSC Specialist Groups, the Freshwater Fish Specialist Group is in the development stages of establishing a new Global Freshwater Fish BioBlitz in partnership with iNaturalist.org. ‘What is a BioBlitz?’ we hear you cry! Well, the BioBlitz will invite members of the general public to contribute their photographs of fishes they have observed in their natural environment from around the world. The photographs, along with details including location of fish observation, observation date and description of specimen and habitat, are uploaded and recorded on an online network. Often referred to as ‘citizen science’; the BioBlitz is an effort to connect members of the public, who are enthusiastic naturalists, with the scientific community. The Global Freshwater Fish BioBlitz aims to help us better understand the distribution and occurrence of species as well as educating and engaging the public in freshwater fish conservation.

The BioBlitz will give people the opportunity to be directly involved in wildlife monitoring, a crucial step in conservation action. With ca. 16,000 freshwater fish species (and with numbers continually growing!), the more people ‘on the ground’ carrying out observations and recording what they have seen, the better. This information can assist the scientific community, with not only monitoring species distributions but also describing new species. It is important to note that the BioBlitz will be a crowd-sourcing social network and not a data archive – i.e. individuals are part of this network and share information on species observations, which the network then verifies or helps to identify. iNaturalist is fully integrated with and can harness photographs from Facebook and Flickr making it easy to turn photographs posted to these sites into iNaturalist observations. Once observations are verified as research-grade, iNaturalist passes them on to data archives, such as the Global Biodiversity Information Facility and Encyclopedia of Life. Furthermore iNaturalist is well integrated with the IUCN Red List. It incorporates Red List taxonomy, range maps and conservation statuses; making it an effective conservation tool. It is the only citizen-science effort displayed on the official Red List maps (<http://www.iucnredlist.org>).

We are currently at the development stage and are very excited to see how the BioBlitz will come to

fruition over the coming months. Discussions are underway to secure the endorsement of conservation organisations that support this initiative and can help with publicity. Please let us know if there are potential partner organizations that you would recommend contacting.

An additional key step in developing the BioBlitz is recruiting volunteers to act as Curators to verify species submitted by members of the public. That’s where you come in! We need proactive and enthusiastic volunteers to make this project a success.

Are you interested in the new Global Freshwater Fish BioBlitz and is it something you would like to be involved in?

Do you have expertise in fish taxonomy?

Do you have expert knowledge of a taxonomic group or fishes found in a particular geographic region?

Are you willing to commit time to verify species identifications?

If so, we would love to hear from you! With the amphibian and reptile bioblitzes, many specialists have benefited from engaging with postings of observations in their area of interest. For example, a FFSG member could subscribe to receive an email summary of all reports of threatened cichlids from Bolivia. These highlights can lead to important research collaborations. For example, one Curator for the Amphibian BioBlitz first spotted what he later confirmed to be a new species (the Andean poison frog, *Andinobates cassidyhornae*) from a photograph shared by an amateur through the BioBlitz. It is also important to note that observations can be identified to coarser taxonomic levels such as genus or family, which is often the case for observations of cryptic species or poor quality photographs.

If you would like to volunteer as a Curator or if you have any questions, please get in touch (s.turnock@chesterzoo.org). This new initiative is a big team effort, supported by international conservation organisations, and to drive the project forward we need your help and expertise.

To give you a feel for what the Global Freshwater Fish BioBlitz will look like and how it will work, please take a look at the Global Amphibian BioBlitz presented by the Amphibian Specialist Group [here](#). Since the Amphibian BioBlitz started two years ago, 1,459 taxa have been

recorded on their network (20% of amphibian species); an impressive start! We hope to mimic this success and bridge the gap between conservation scientists and the general public in our efforts to conserve freshwater fishes.

ASG IUCN SSC Amphibian Specialist Group

HOME ABOUT US» THE ACTION» RESOURCES» RLA» SUPPORT CONTACT

Amphibian Specialist Group

Global Amphibian BioBlitz

The **Global Amphibian BioBlitz** (GAB) is citizen-science effort presented by the **ASG** and other conservation organizations to harness amateur amphibian observations to enhance our understanding of the distribution and conservation status of amphibians globally.

Add Observations 1466 taxa observed powered by **Naturalist.org**

Map Satellite

Recent Observations

- Paracassina kounhiensis**
Observer: kerejoo
Date: the past
Place: 6.68588... , 38.4123... (Google, OSM)
[View »](#)
- Giant Toad**
Observer: dreterj
Date: May 26, 2013
Place: Carara National Park, Costa Rica (Google, OSM)
[View »](#)
- Gulf Coast Toad**
Incius nebulifer
Observer: toby
Date: Jun 8, 2013 09:38 PM CDT
Place: Matagorda Island State Park, East O'Connor, Texas, US

Top Contributors

- devinedmonds**
156 species
226 observations
- herpguy**
133 species
157 observations
- benjamin**
134 species
170 observations
- jplarry**
132 species
251 observations
- mikeygraz**
110 species
124 observations
- asydabass**
92 species
125 observations
- kucycads**

Global Amphibian BioBlitz find every one...

These are the six most recent contributions to the Global Amphibian BioBlitz, an ASG collaborative effort to collect amateur observations of all of the world's amphibians to help inform amphibian conservation. To add your own observations, click here or watch this tutorial on how to contribute.

The Global Amphibian BioBlitz presented by the IUCN SSC Amphibian Specialist Group available online [here](#)

Introducing FFSG Regions: Southern Africa

Paul Skelton

FFSG Chair for Southern Africa Region

Africa, the second largest continent, straddles the equator and projects as a giant peninsula into the southern Atlantic and western Indian Oceans. Traditionally, for freshwater fishes, the southern African region is bounded in the north by the watershed of the Cunene, Okavango and Zambezi River systems and by the African coast for the rest. More recently for the IUCN Pan-African assessment the region extended on the west coast to include the Quanza River basin and the coastal rivers south to the Cunene. Countries included in this region are in part Angola, Zambia, Malawi and Mocambique, and fully Namibia, Botswana, Zimbabwe, South Africa, Lesotho and Swaziland.

Extending around the coastal perimeter there is a low-lying coastal band, broadest in Mocambique, but narrow in the south-east and south. The perimetral strip is bounded on the interior by an escarpment that varies in nature from abrupt and steep mountains to broken ranges and hills. The interior of southern Africa forms an extensive elevated plateau of around 1500-2000m, but reaching above 3000m in the high Drakenberg-Maloti mountains of Lesotho. The plateau is breached by the larger rivers of the region – the Zambezi, Limpopo, Incomati and Phongolo flowing east to the Indian Ocean, and the Orange, Cunene and Quanza flowing west to the Atlantic. Uniquely the Okavango flowing south from the Eastern Angolan highlands ends as the spectacular Okavango Delta in the Kalahari of Botswana. In the past the Delta formed a large lake, now remnant as the Magadigadi pans. Between these larger systems the other rivers are generally coastal and relatively small. Although Lake Malawi is excluded from the region it does discharge through the Shire tributary of the lower Zambezi. Apart from a few small coastal lakes there are no major lakes in the region. Several major man-made lakes occur on the large river systems including Lake Kariba, Lake Cahorra Bassa on the Zambezi, and Lake Gariep and Lake Vanderkloof on the Orange. Most rivers are highly regulated by dams and a recent estimate indicates that only 4% of the river reaches in South Africa are 'free-flowing'.

Climate varies considerably with the northern sectors embracing a warm tropical or, over the southern plateau reaches, a warm temperate summer rainfall system and in the extreme south-west and southern extremities a temperate winter rainfall belt. Rainfall varies from as high as 1400mm⁻¹ in the extreme

north-west and south west, to under 250mm⁻¹ in the western Namib and Kalahari basins. Consequently, the western half of southern Africa is predominantly dry and includes the Namib Desert along the coast, the Kalahari, and the Karoo semi-desert environments.

Biodiversity

With a wide variety of habitats and ecoregions, southern Africa is remarkably rich in plant, invertebrate and vertebrate biodiversity. The Cape Floral Kingdom is a distinctive and spectacular component of the coast and mountains of the southern and south-west areas. Afromontane forests occur in patches along the eastern montane archipelago from Malawi to the Cape. Grass and shrublands dominate the more southerly and high-altitude inland plateaus with savannah bush and woodlands found around the eastern coastal and tropical inland belts. Recent estimates of freshwater dependent invertebrates include few molluscs (45) and crustaceans (27) and around 200 insects from southern Africa. The aquatic dependent vertebrate fauna of the region includes 197 frogs, 7 reptiles, around 428 water birds and 15 mammals, all relatively well described in field guides and other specialized books.

Freshwater fish species

The current estimate of freshwater fishes from the region (excluding Lake Malawi/Nyassa) is around 350, including those tolerant of brackish water. The tropical fauna extending south to the Orange River and to coastal KwaZulu-Natal in South Africa is richest and overlaps a restricted temperate fauna in the far south. The main tropical fishes include the families Protopteridae, Mormyridae, Kneriidae, Cyprinidae, Alestidae, various catfish (siluriform) families, Poeciliidae, Nothobranchiidae, Cichlidae, Anabantidae and Mastacembelidae. The temperate fauna includes unique relict groups with a high endemism and restricted ranges and includes the families Cyprinidae, Austroglanididae, Anabantidae and Galaxiidae. The temperate fishes are distinct in an African context, for example the temperate cyprinids are 80% polyploid species including hexaploids and tetraploids. Recent studies have shown that there are many cryptic species that need description within the genus *Pseudobarbus*. In addition, the African galaxiid (currently a single species) is known to embrace a cluster of species yet to be taxonomically defined. Much of this diversity is highly restricted in distribution and many species are threatened.



Olifants River,
Kruger National Park
© Paul Skelton

The phylogenetic relationships of the catfish family Austroglanididae, found only in the Orange and west-coast Olifants river systems are proving hard to define. Likewise the southern anabantid genus *Sandelia* is now known to be more diverse than the two species recognized for many years.

Conservation of freshwater fishes

The IUCN assessment of southern Africa, completed in 2009 indicated that 40 (11%) species out of 355 assessed are globally threatened (i.e. either Critically Endangered, Endangered or Vulnerable). 235 (66%) are of Least Concern and 71 (19.6%) are Data Deficient. The main threats to freshwater fishes are introduced alien fishes, and habitat degradation from damming and water abstraction for agriculture, industry and urban consumption, as well as impacts from pollution and the erosion of genetic integrity. The pressures on water resources from a rapidly increasing urban population in the various countries of the region is aggravating aquatic environmental degradation in many places. Mining and the long-term impacts of mining on water quality is a great concern in South Africa. A recently published atlas of freshwater ecosystem priority areas summarises graphically the state of rivers in the country. The atlas provides maps to support sustainable development of water resources and is an important step towards the long-term conservation of freshwater

ecosystems in South Africa.

Conservation activities have taken place in South Africa and to a limited extent in other countries of the region. Studies on threatened fishes in certain specific sites such as Aigamas cave and the Lake Guinas sinkhole in Namibia as well as research and faunal surveys have also occurred in other countries in the region. In the Cape conservation efforts focused on the threat from alien fishes have included a recent pilot effort to rehabilitate a stream through alien fish eradication has been well publicised. National environmental conservation planning for rivers is advanced in South Africa. In addition, the South African Water Act (1998) was completely revised to include provisions for water for ecosystem services and river functioning for the first time. In South Africa efforts to mitigate the impact of dams and weirs as well as alien fishes have also been made by both government departments and the private sector. A noteworthy effort to provide alternative fishing of indigenous species in place of alien trout and bass has included research on the biology and ecology of potential indigenous angling species and threatened species. A research programme on fish passways has improved understanding of the movement of indigenous fishes and the role and design of fish passways as conservation tools.



Witte River in the
Western Cape
© Paul Skelton

IUCN engagement

Although a formal committee of members has not been established in the region there is an active network of individuals engaged in fish research and conservation, including government agents, members of NGOs and a variety of research institutions that collectively contribute to fish conservation in Southern Africa. Many of these individuals contributed directly to the recent IUCN Assessment of 'The Status and Distribution

of Freshwater Biodiversity in Southern Africa' (Darwall *et al.*, 2009).

Reference

Darwall, W.R.T., Smith, K.G., Tweddle, T., and Skelton, P. (eds) (2009). *The Status and Distribution of Freshwater Biodiversity in Southern Africa*. Gland, Switzerland: IUCN and Grahamstown, South Africa: SAIAB. viii+120pp.



Professor Paul Skelton

FFSG Chair for Southern Africa Region

Paul recently retired as Managing Director of South African Institute for Aquatic Biodiversity after 16 years in that position. Prior to that (1984-1995) he served as Curator of Freshwater Fishes at the JLB Smith Institute of Ichthyology (before it became SAIAB), and also as Curator of Fishes at the Albany Museum from 1972-1983. His research career mostly concerned the taxonomy of southern African freshwater fishes and their conservation. He evaluated the threatened species and wrote the South African Red Data Book for fishes in 1977 and 1987. He has conducted fieldwork and projects throughout southern Africa, and has travelled extensively to the major international museums with African freshwater fish holdings. He has been a member of the IUCN SSC/WI Freshwater Fish Specialist Group since its beginnings and was the project leader for the recent southern African assessment as part of the Pan-African assessment completed in 2011.

Fiji freshwater fish graces new 10-dollar bill: Bringing freshwater fish into the popular consciousness

Aaron P. Jenkins

FFSG Representative, Oceania

On the second of January this year a new set of banknotes and coins went into circulation in Fiji featuring imagery of unique flora and fauna. It was my absolute privilege to be part of the process of designing the new currency. Fiji's endemic flora and fauna designs now replace the portrait of Her Majesty Queen Elizabeth II across all denominations. The process commenced in 2010 when the United Nations declared International Year of Biodiversity and I was asked around mid-2011 to present a variety of options to the Reserve Bank Board for an endemic freshwater fish to grace the new 10-dollar note. I presented several options including the largest endemic freshwater fish in the Pacific, the orange spotted therapon (*Mesopristis kneri*), a new freshwater pipefish (*Hippichthys albomaculatus*) that I had discovered in 2009, and Lever's goby (*Redigobius leveri*). After much debate Lever's goby was chosen for its unique history and because it is one of only two fishes known to be completely confined to freshwater in the country. This fish reaches a maximum size of 4.4cm, which is quite large for this genus and is most commonly found in

clear, rapid flow, mid-reach and upper catchment areas over boulders within highly vegetated areas. Their presence in any river is an indicator of good habitat quality and minimal catchment disturbance.

Mr. R. Lever was a New Zealander who was working as a government entomologist in Fiji trying to keep the pests off the burgeoning sugar cane industry. In the early 1940's he sent a variety of fish specimens to the famous ichthyologist, Henry Fowler who was the Curator of Fishes of the Academy of Sciences of Philadelphia and described Lever as a "valued correspondent". Fowler described the species as new and named the fish after Lever in 1943.

In 2003, I was teaching a course on freshwater fish taxonomy at University of South Pacific and as part of a field trip we caught a number of specimens and I photographed one, which was later used on a stamp and began a re-recognition of this endemic species in Fiji.



Original photo of *Redigobius leveri* taken at a field course at USP in 2003 © Aaron Jenkins



Aaron Jenkins at the unveiling of the new 10 dollar note in Suva, Fiji (January 2013)

It is important that this unique species is now recognized and that it helps create public awareness of the threats to biodiversity. What better way to do this than on the currency that is used by all Fijian citizens? This currency change is also significant because members of the British Royal Family have been on Fiji currency over the past 78 years.

In the process of designing the bill I provided photos and critiqued the engravings that were done before they were finalized. The image is taxonomically accurate down to the finray and scale count, much to the dismay of the engraver who later said to me that he had never had an image come back so many times for changes. I'm happy with the result and proud to see a freshwater fish on Fiji's currency.

Activities of the South Asia Office of the Freshwater Fish Specialist Group (September 2012 to April 2013)

Rajeev Raghavan

FFSG Co-Chair for South Asia Region

The newly formed South Asia office of the FFSG has been actively involved in research, advocacy and policy making on freshwater fish conservation related issues in the South Asia region. Some of the important activities, that the office has been involved, are summarised below.

1. Co-organized a WORKSHOP ON CHALLENGES FOR FRESHWATER FISH CONSERVATION held at the Periyar Tiger Reserve, Thekkady, India on 27th and 28th September 2012. The workshop was organized with an aim to devise suitable action plans and mechanisms to create awareness, as well as develop and implement conservation, management and policy actions for freshwater biodiversity conservation in the Western Ghats Hotspot. A special session was also devoted to the conservation of endemic fishes of Periyar Tiger Reserve.

2. Provided technical advice for bringing out an EDUCATIONAL POSTER ON THE ENDEMIC AND THREATENED FISHES OF PERIYAR TIGER RESERVE (see page 13). For high resolution posters please contact Rajeev Raghavan - rajeevraq@hotmail.com

3. The South Asia office is an official partner on the 'Lost fishes of Western Ghats' project funded by the Mohammed Bin Zayed Species Conservation Fund and Chester Zoo, UK.

4. Initiated the FRESHWATER FISH CONSERVATION NETWORK OF SOUTH ASIA (FFCNSA) to identify and coordinate a network of ichthyologists who will work together to raise the profile for freshwater fish conservation in this region. To date, around 50 ichthyologists working in the South Asia region have enrolled as members of the network. For more information and an application form please visit <http://www.zooreach.org/Networks/Fish/Fish.htm>

5. Provided scientific advice and input for the SAHYADRI FRESHWATER BIODIVERSITY CONSERVATION EDUCATION TRAINING WORKSHOP held at Coimbatore, India from 25th to 27th February 2013. The aim of the workshop was to transfer the results of the recently completed IUCN Freshwater Biodiversity Assessments in the Western Ghats to a wide range of stakeholders including local people, school and college students and journalists living in peninsular India. As part of the project a teaching manual and a variety of education materials were developed. For more information please visit http://www.zooreach.org/ZOO_WILD_Activities/2013/27Feb2013_FWB.htm

6. Co-organized the 'EXOTIC FISH' FREE PERIYAR TIGER RESERVE CAMPAIGN (see detailed news on page 14)



Sanjay Molur (ZOO Outreach Organization, Coimbatore, India) and Sanjayan Kumar (Deputy Director, Periyar Tiger Reserve) releasing the poster on Alliance for Zero Extinction Species during the Workshop on Challenges for Freshwater Fish Conservation. © Sanjay Molur

Endemic and Threatened Fishes of Periyar Tiger Reserve

തേക്കടി പാണ്ടൻ കൊയ്മ



Periyar Blotched Loach
Nemacheilus menoni Zacharias & Minimol, 1999
Vulnerable

കരിമ്പാച്ചി



Periyar Latia
Crossocheilus periyarensis (Menon & Jacob, 1996)
Endangered



Peninsular Hill Trout
Lepidopygopsis typus Raj, 1941
Endangered

***AZE species**



Periyar Barb
Hypselobarbus periyarensis (Raj, 1941)
Endangered

***AZE species**

തേക്കടി കല്ലൊട്ടി



Periyar Stone Sucker
Garra periyarensis Gopi, 2001
Vulnerable

കടുവ കൊയ്മ



Periyar Reticulated Loach
Nemacheilus periyarensis Kurup & Radhakrishnan, 2005
Vulnerable

(ബാഹ്യമണകണ്ട



Conservation Research Group KERALA



FFSG Freshwater Fish Specialist Group

CRITICAL ECOSYSTEM PARTNERSHIP FUND

The Indian Alliance for Zero Extinction



* AZE (Alliance for Zero Extinction) species: Species prioritized by the Indian AZE, occurring in a single location and assessed as Critically Endangered or Endangered with a very high risk of extinction.
 * AZE (Alliance for Zero Extinction) species: Species prioritized by the Indian AZE, occurring in a single location and assessed as Critically Endangered or Endangered with a very high risk of extinction.

Towards an 'Exotic Fish' Free Periyar Tiger Reserve

Kaimal Krishnakumar¹ and Rajeev Raghavan²

¹Researcher, Conservation Research Group (CRG), Kochi, India; ²FFSG Co-Chair for South Asia Region



Local fisherman in the Periyar Tiger Reserve © Rajeev Raghaven

The waters of the Periyar Tiger Reserve (PTR) in the Western Ghats Hotspot, India harbour unique assemblages of evolutionarily distinct and globally endangered fish species. One genus (*Lepidopygopsis*) and eight species are currently known to be endemic to the PTR. These include two species each within the Genus *Garra* (*G. mlapparaensis* and *G. periyarensis*) and *Nemacheilus* (*N. menoni* and *N. periyarensis*), and species of *Homaloptera* (*H. silasi*), *Hypselobarbus* (*H. periyarensis*), *Crossocheilus* (*C. periyarensis*) and *Lepidopygopsis* (*L. typus*). The PTR is therefore one of the most critical freshwater fish habitats in southern Asia, and an ecosystem in need of urgent conservation attention.

Biological invasion is one of the major threats in the region with populations of four alien species, *Clarias*

gariepinus, *Cyprinus carpio*, *Oreochromis mossambicus* and *Poecilia reticulata* increasing like never before. Two alien species, *C. carpio* and *O. mossambicus* now dominate the fishery and compete for food with endemic species such as *H. periyarensis*, and *L. typus*.



African catfish (*Clarias gariepinus*) caught in Periyar Lake © Rajeev Raghaven



Some of the participants at the Alien Fish Removal Campaign © Rajeev Raghaven

A two-step strategy has been devised to manage alien fish species in this landscape. This includes eradication of existing alien fish populations, and developing and implementing education and awareness campaigns to stop future introductions and escapes. With an aim to eliminate the most important alien fish that has invaded the Periyar Tiger Reserve, the African catfish, *Clarias gariepinus*, a one day campaign was organized on 30th May 2013 by the Kerala State Department of Forest and Wildlife, and the Conservation Research Group (CRG), St. Albert's College, Kochi, India in collaboration with many national and international partners including the IUCN SSC/WI Freshwater Fish Specialist Group (FFSG).

The one day campaign attended by 45 volunteers, 15 officials of the State Forest and Wildlife Department, and 20 members of the indigenous tribal communities resulted in the capture of 92 individuals of *C. gariepinus* ranging in size from 190mm to 425mm. Fish caught were subsequently euthanized and removed from the Park boundary. The success of this initiative has resulted in the State Department of Forest and Wildlife show willingness to continue the activity on a monthly basis by deploying their staff to catch and remove as many *C. gariepinus* as possible from the ecosystem. Plans are also being developed to provide incentives to indigenous fishers in the Periyar Tiger Reserve to catch alien fish species from the lake.

**TOWARDS AN ' EXOTIC FISH ' FREE PERIYAR TIGER RESERVE
APRIL 29 & 30, 2013**

The waters of the Periyar Tiger Reserve (PTR) harbour unique assemblages of evolutionarily distinct and globally endangered freshwater fishes. Eight species of fish found in PTR are found nowhere else in the world. Yet, they are fighting for survival as their only remaining habitats are threatened by several stressors of which biological invasion is the most significant one. Four species of exotic fish currently occur in the PTR and their populations are increasing like never before. Unless, urgent conservation plans are put in place, we may lose the eight endemic species forever.

The Conservation Research Group (CRG), St. Albert's College, Kochi is pleased to invite you to participate in the first ever campaign against exotic fish species in India at the Periyar Tiger Reserve on 29th and 30th of April 2013. As an initial step towards an 'exotic fish' free PTR, the mass removal of African Catfish from the Periyar Lake is being carried out through public participation.

For participation contact : Krishnakumar K, kkaqua@gmail.com, +918891345254






Poster advertising the event








New fish species described in 2012-2013 from South Asia

Waikhom Vishwanath

FFSG Co-Chair for South Asia Region

The South Asia region is rich in freshwater fish fauna. The rich diversity is attributed to the tectonic framework of the region and the different drainage systems, viz. the Indus in the west, the Ganga-Brahmaputra and the Meghna-Surma in the north, the Chindwin-Irrawaddy and the Kaladan in the east and the rivers of the Peninsular India, viz. the Narmada, Tapi, Godavari, Krishna and Cauvery and many streams and rivers in Sri Lanka in the south. Several ichthyologists contributed to the discovery and description of fishes since the early 19th century. However, many areas have never been visited by ichthyologists due to inaccessibility. Evaluation of many more new forms are expected. There is need for extensive survey of the fauna and evaluate their status. In the past few years, fish faunal survey gained momentum and over 25 fish species have been described new to science during 2012 and 2013. The species are listed below:

<p>1. <i>Aborichthys waikhomi</i> Kosygin, 2012. Bulbulia stream, a tributary of Noa Dehing River, Namdapha, Arunachal Pradesh, India. <i>Rec. Zool. Survey India.</i>, 112(1): 49-55</p>	 <p>© L. Kosygin</p>
<p>2. <i>Barilius profundus</i> Dishma & Vishwanath, 2012. Kaladan R., Mizoram. <i>J. Threatened Taxa</i>, 4(2): 2363–2369</p>	 <p>© W. Vishwanath</p>
<p>3. <i>Balitora jalpalli</i> Raghavan, Tharian, Ali, Jadhav & Dahanukar, 2013. Western Ghats, Kerala, India. <i>J. Threatened Taxa</i>, 5(5): 3921–3934.</p>	 <p>© Neelesh Dhanukar</p>
<p>4. <i>Balitora laticauda</i> Bhoite, Jadhav & Dahanukar. Krishna River, Western Ghats, Maharashtra, India. <i>J. Threatened Taxa</i>, 4(11): 3038–3049</p>	 <p>© Neelesh Dhanukar</p>
<p>5. <i>Danio flagrans</i> Kullander, 2012. Headwaters of Mali-Hka R., Irrawaddy drainage, Myanmar. <i>Ichthyol. Explor. Freshwaters</i>, 23 (3): 245-262</p>	 <p>© Ralf Britz</p>

<p>6. <i>Dario urops</i> Britz, Ali & Philip, 2012. Tributary of Valapattanam R., in southern Karnataka and from Wayanad District, Kerala, India. <i>Zootaxa</i> 3348: 63</p>	 <p>© Ralf Britz</p>
<p>7. <i>Garra namyaensis</i> Shangningam & Vishwanath, 2012. Namya R., Manipur, India. <i>ISRN Zoology</i>, doi: 10.5402/2012/325064 and validation in <i>Ichthyol. Explor. Freshwaters</i>, 23(1): 10</p>	 <p>© W. Vishwanath</p>
<p>8. <i>Glyptothorax churamanii</i> Rameshori & Vishwanath, 2012. Kaladan R., Mizoram, India. <i>Zootaxa</i>, 3538: 79–87</p>	 <p>© W. Vishwanath</p>
<p>9. <i>Glyptothorax elankadensis</i> Plamootil & Abraham. 2012. <i>Biosystematica</i>, 6(2): 17-25</p>	<p>Image unavailable at time of publication</p>
<p>10. <i>Glyptothorax jayarami</i> Rameshori & Vishwanath, 2012. Kaladan R., Mizoram, India. <i>Zootaxa</i> 3304: 54–62</p>	 <p>© W. Vishwanath</p>
<p>11. <i>Glyptothorax maceriatius</i> Ng & Lalramliana, 2012. Meghna-Surma river system in Mizoram, India. <i>Zootaxa</i>, 3416: 44–52</p>	 <p>© W. Vishwanath</p>
<p>12. <i>Glyptothorax scrobiculus</i> Ng & Lalramliana, 2012. Tributaries of Tuivai R., Mizoram, India. <i>Ichthyol. Explor. Freshwaters</i>, 23,(2): 97-104</p>	 <p>© Lalramliana</p>
<p>13. <i>Glyptothorax verrucosus</i> Rameshori & Vishwanath, 2012. Kaladan R., Mizoram, India. <i>Ichthyol. Explor. Freshwaters</i>, 23 (2): 147-154.</p>	 <p>© W. Vishwanath</p>

14. *Parambassis bistigmata*

Geetakumari, 2012. Brahmaputra basin, Northeast India. *Zootaxa* 3317: 59–64



© W. Vishwanath

15. *Parambassis waikhomi*

Geetakumari & Basudha, 2012. Loktak Lake, Manipur, India (Chindwin basin). *J. Threatened Taxa*, 4(14): 3327–3332



© W. Vishwanath

16. *Physoschistura chindwinensis*

Lokeshwar & Vishwanath, 2012. Lokchao River at Moreh, Manipur, India (Chindwin basin). *Ichthyol. Res.* 59:230–234



© W. Vishwanath

17. *Physoschistura dikrongensis*

Lokeshwar & Vishwanath, 2012. Dikarong R. at Doimukh, Arunachal Pradesh, India (Brahmaputra basin). *Zootaxa*, 3586: 249–254



© W. Vishwanath

18. *Physoschistura tigrina*

Lokeshwar & Vishwanath, 2012. Changa R., Ukhrul district, Manipur, India (Chindwin drainage). *Zootaxa*, 3586: 95–102



© W. Vishwanath

19. *Physoschistura tuivaiensis*

Lokeshwar & Vishwanath, 2012. Tuivai R. at Likhailok, Churachandpur district, Manipur, India (Brahmaputra basin). *Taprobanica*, 4(1): 52-58.



© W. Vishwanath

20. *Schistura aizawlensis*

Lalramliana, 2012. Muthi R. Barak basin, Mizoram, India. *Ichthyol. Explor. Freshwaters*, 23,(2): 97-104



© Lalramliana

21. *Schistura koladyensis*

Lokeshwor & Vishwanath, 2012. Koladyne R., Mizoram, India. *Ichthyol. Explor. Freshwaters*, 23 (2): 139-145.



© W. Vishwanath

22. *Schistura obliquofascia*

Lokeshwor, Barat, Sati, Darshan, Vishwanath & Mahanta, 2012. Kalsa R. at Chanfi, Uttarakhand, Ganga basin. *Zootaxa*, 3586: 255–263



© W. Vishwanath

23. *Pseudolaguvia viriosa*

Ng & Tamang. 2012. Brahmaputra drainage, Arunachal Pradesh, India. *Zootaxa*, 3522: 81–88



© Lakpa Tamang

24. *Pangio ammophila*

Britz, Ali & Raghavan, 2012, Kumaradhara River, Karnataka, India. *Ichthyol. Explor. Freshwaters*, 23 (1): 45-50.



© Ralf Britz

25. *Pseudolaguvia lapillicola*

Britz, Ali & Raghavan. 2012. Kumaradhara River, Karnataka. *Ichthyol. Explor. Freshwaters*, 23 (4): 289-295



© Ralf Britz

26. *Schistura porocephala*

Lokeshwor & Vishwanath, 2013. Kaladan River, Mizoram. *Ichthyol. Res*, 60(2): 159-164



© W. Vishwanath

27. *Glyptothorax pantherinus*

Anganthoibi & Vishwanath, 2013. Noa Dehing R., Arunachal Pradesh (Brahmaputra basin). *Ichthyol. Res*, 60(2): 172-177



© W. Vishwanath

Activities in Northeast India

Prof. D.N. Das of the Department of Zoology, Rajiv Gandhi University, Arunachal Pradesh reports that University Grants Commission, Government of India recognized the department as the Centre for Potential Excellence in Biodiversity. The centre is engaged in molecular discrimination of certain polymorphic fish species and DNA barcoding of endemic fish species of the eastern Himalayan region; study of biology and the life history strategies of selected food fishes of the eastern Himalayan region and reproductive physiology of certain threatened ornamental and food fishes. Recently, the team visited Menchukha valley at a height of 6,254 feet above sea level where the Yargyapchu River flows. Interesting specimens were collected and are in the process of being identified.

College of Fisheries, Agartala, under the leadership of Prof. J.R. Dhanze, Dean of the college, organized Fish Taxonomy Training workshop as a part of the exploration and molecular characterization of fishes of northeast India under a Department of Biotechnology, Government of India project.

Department of Life Sciences, Manipur University is actively engaged in the characterization of endemic fishes of northeast India. As many as 13 new species have been described by the team from the region in the years 2012-2013. Wherever the team visits, village authorities and government departments are well informed and involved in the sampling. Meetings are held to discuss and understand the objectives of such studies. Endemic food and ornamental fishes are collected live and attempts have been made to breed them in the laboratory. Bangana devdevi, an important food fish, once reported to be widely distributed, but now in the verge of extinction from the water bodies of Manipur have been successfully bred in the aquarium, recently.



Unidentified *Glyptosternine* fish from Yagyapchu River © Waikhom Vishwanath

However, Lakpa Tamang, an ichthyologist is concerned about the hazardous methods of fishing in the Senkhi stream in Arunachal Pradesh. People adopted destructive methods of fishing, e.g. electrocution, use of bleaching powder, liming and dynamiting; thus, posing a threat to the fish population, which otherwise would have been sustainable had they used traditional gears.

State department of forest looks after the welfare of the freshwater fauna in most of the states in Northeast India. Researchers need to obtain permission from Forest Department authorities for sampling fishes for research purposes. Despite the fact that village authorities and civil organizations are concerned about the need for conservation of species, unauthorized illegal fishing is practiced widely in the interior areas. Government departments are stocking Tilapias and other exotic fishes in the natural water bodies in an attempt to increase food fish production and are unaware of the impacts of such fishes to the native species and the aquatic ecosystem. Massive awareness programmes and education of all concerned is required to conserve the aquatic ecosystem and the native species.



Destructive methods of fishing in the hill streams of northeast India: Application of plant poisons [left] and electrofishing [right] © Waikhom Vishwanath

First comprehensive Red List workshop for all freshwater fishes of the Middle East

Jörg Freyhof

FFSG Chair for the European Region

The Middle East is one of the most important hotspots for freshwater biodiversity in the European Region. There are actually 373 freshwater fish species which have not yet been assessed against the IUCN Red List criteria, or for which the assessments are outdated. As there are very many species with an extremely poor conservation status, my team worked hard to find funding for a comprehensive Red List assessment; and also for a complete “Key Biodiversity Area” assessment for this critical region.

In July 2012, a \$248,332 grant was awarded to the IUCN (Global Species Programme; Freshwater Biodiversity Unit). The grant (Freshwater Biodiversity Assessment and Conservation Priorities for the Mediterranean Basin Hotspot) funds the research and mapping of ecological data for key freshwater species groups in the eastern Mediterranean. These data are used to identify Key Biodiversity Areas (KBAs) and assess human use. Have a close look at <http://www.birdlife.org/community/2013/06/freshwater-biodiversity-workshops-pave-the-way-for-further-research-in-the-mediterranean-basin/> As well as fish, freshwater plants and mollusks are covered within this project. While the

Mediterranean is the central agenda, Middle Eastern freshwater fishes, are also taken into account.

A key output of the grant is organising stakeholder workshops throughout the Mediterranean Biodiversity Hotspot. The workshops will focus on the identification of KBAs, sustainable management techniques, optimal conservation strategies, and the identification of organizations to take the lead on conservation actions at each site. The freshwater KBAs will be entered into the World Bird Database (WBDB) enabling them to be publicly recognised alongside other indicators (e.g. IBAs, AZEs, and terrestrial KBAs). This represents an important step forwards in the protection of freshwater biodiversity in the face of development.

We have carried out one very successful KBA workshop to validate and create awareness of proposed sites in December 2012 in Bosnia and Herzegovina. IUCN workshop on Freshwater Key Biodiversity Areas in Bosnia and Herzegovina. Additional KBA workshops will be performed through the project BioFresh (www.freshwaterbiodiversity.eu) in 2013 and 2014.



The Azraq Red List Team © Jörg Freyhof



The fish team: Jörg Freyhof, Güler Ekmekci, Kevin Smith, and Atheer Ali © Jörg Freyhof

The second workshop was the IUCN Red List review workshop on freshwater biodiversity of the eastern Mediterranean, hosted in Jordan. The workshop was kindly hosted by Royal Society for Conservation of Nature, Jordan at their Azraq Wetland Reserve and facilitated by IUCN Global Species Programme and Mediterranean Office.

The eastern part of the Mediterranean Basin is the only region within this Hotspot where the conservation status of freshwater biodiversity is unknown. Draft Red List assessments and distribution maps for almost 500 species of freshwater fishes, mollusks and plants were reviewed by biodiversity experts from across the region and Europe. The review workshop was held in the famous Azraq oasis. Despite generous hospitality by the Jordanian Royal Society for the Conservation of Nature, nice sunshine, fine bird migration and many inspiring discussions with all colleagues, the workshop was hard work! When completed, these data will be used to identify local freshwater KBAs by running similar workshop as already undertaken in Bosnia and Herzegovina.

The workshop was also a great opportunity to visit Azraq oasis, which is the home of the famous, endemic *Aphanius sirhani*, the Azraq killifish (a species whose conservation under Dr Nashat Hamidan of the JRSCN, has been supported by Chester Zoo). Despite exemplary



***Aphanius sirhani*, the Azraq killifish
© Nashat A. Hamidan**

awareness raising, the Azraq killifish is now completely conservation dependent in its natural habitat. The water table dropped down in the oasis (due to excessive abstraction), and the springs dried out in the early 1990s. Since then, water is pumped into the wetland. However, alien invasive cichlids have not been eradicated. While large ponds with *A. sirhani* only exist in the wetland, some are still infected with the aliens. This conservation project is funded by the Critical Ecosystem Partnership Fund (CEPF), MAVA Foundation pour la Nature (MAVA), the Ministerio de Asuntos Exteriores y de Cooperación (AECID) and the BioFresh Project.



An *Aphanius* pond in Azraq oasis infected with alien cichlids © Jörg Freyhof

Kinabatangan River Spirit Initiative, Malaysia

Tun-Min Poh¹ and Suzanne Turnock²

¹Kinabatangan River Spirit Initiative; ²FFSG Programme Officer

As well as being the main donor for the FFSG, Chester Zoo has once again shown its support for freshwater fish conservation, by awarding a Conservation and Research Grant to the Kinabatangan River Spirit Initiative, Malaysia. Found within the most isolated of Borneo's watersheds, the Kinabatangan River has the highest levels of freshwater species endemism on the island. However, the river's catchment has experienced drastic landscape changes and, today, more than 50% of the river basin continues to be actively logged; while at least 25% is utilized as agricultural land. Habitat degradation is the leading threat to freshwater fishes in Malaysia (Chong *et al.*, 2010). The high endemism of fish species in the Kinabatangan catchment, paired with the current lack of information about the status of these fishes (Chong *et al.*, 2010), make the potential for loss, and the need for action, even more pressing. The continued decline of the Kinabatangan catchment jeopardizes food security, livelihoods, the tourism industry and environmental services provided by the river. Although human riverine communities recognize the changes in the river, there is no hard evidence for the loss in native fish diversity and abundance, and more importantly, the few river studies conducted here have offered no



real remedy for declining river health. Positive change has yet to be experienced locally, and communities have been left to adapt to the seemingly inevitable deterioration of the environment.

The project, endorsed by the FFSG, was conceived on the basis that community participation in research and management is critical for achieving a healthy river. The project has been developed based on the needs identified by the local Kinabatangan community. The project aims are to enhance knowledge and knowledge-sharing of the river's condition; and to empower local communities to take action.



Local fisherman checking his gill nets on the Kinabatangan River © Tun-Min Poh (KRSI)

Envisioned as a long-term project, the first phase will be for 2-years. It will produce baseline data on fish diversity and ecological assemblages; a list of the status of threatened freshwater fish species for the Lower Kinabatangan; the identification of practical conservation actions that can be implemented by the local communities; a strong argument for sustainable development practices in the Kinabatangan catchment; and a long-term monitoring methodology for river health. The project takes a multi-species approach and uses fish as an indicator for river health; focusing on the Critically Endangered great-tooth sawfish (*Pristis microdon*), Endangered giant freshwater whipray (*Himantura polylepis*) and Borneo river shark (*Glyphis fowleri*; currently Not Evaluated). The project, which started in February 2013, is now well underway. Initial fish and river workshops, pilot interview surveys, and consultations with local communities have commenced.

The vision is of a healthy Kinabatangan River, which supports robust freshwater biodiversity and the persistence of a thriving local culture, with sustainable

development. Chester Zoo has provided invaluable support, which enables us to strive to realize our vision and together 'we act for wildlife'!

If you would like to find out more about Chester Zoo's Conservation and Research Grants, please visit the Conservation pages on the zoo's website [here](#) and you can also find out about the Act for Wildlife campaign led by Chester Zoo [here](#).



Reference

Chong, V. C., Lee, P. K. Y. and Lau, C. M. (2010) Diversity, extinction risk and conservation of Malaysian fishes. *Journal of Fish Biology*. 76:9, 2009-2066



**Fish and river workshops, and consultations with local communities © HUTAN-KOCP [left]
© Tun-Min Poh (KRSI) [right]**

The case for establishing a global working group for the conservation of freshwater migratory fish species

Claudio Baigún¹, Zeb Hogan² and Taej Mundkur³

¹ Fish Programme Coordinator, Wetlands International Argentina; ² CMS Scientific Councilor for Fish, Convention on Migratory Species; ³ Programme Manager, Wetlands International Headquarters.

An increasing number of freshwater fish species around the world, particularly migratory species, are being affected by man-made changes to riverine ecosystems that have impacts within and beyond national boundaries. Migratory fish are exposed to threats such as overfishing, damming, habitat degradation, industrial, agricultural and urban water pollution, mining and dredging (Lucas and Baras, 2001). Climate change is also promoting changes in fish abundance and distributions, although most of what we know is still related to salmonids (UNEP-CMS, 2006). River fragmentation is perhaps the most pervasive impact on migratory species (at different spatial and temporal scales) by blocking migratory movements of larvae, juveniles and adults, and modifying or removing critical habitats. Dams are being built on every continent, without the developers gathering adequate information about potential impacts of dam construction on lesser-known migratory species. Obstruction of free movement along main channels, or between the channels and floodplain areas, could strongly affect their life cycles - since migratory species exhibit strong adaptations to cope with hydrological and environmental variability through their feeding, spawning, refuge and thermal regulatory movements.

Freshwater fishes comprises around 15,000 species representing 40-45% of global fish diversity, with the highest species richness (32%) found in South America (Leveque *et al.*, 2008). Some 10 % of them could be considered as migratory at a global scale. Freshwater fishes represent 41 % of world's ichthyofauna, which is noteworthy, considering that freshwater represents only 2.5% of total world water (Helfman, 2007). Migratory species have a wide spectrum of life histories encompassing potadromous, anadromous, catadromous and amphidromous migratory strategies. This may require species to move through different freshwater habitats, cross national boundaries, and visit coastal and marine environments. Variability among migratory species strongly differs between continents and taxonomic orders. Most migratory species inhabit South American basins, whereas Europe has low fish diversity compared with other continents but a high degree of endemism (Hogan, 2011).

Of approximately 15,000 species of freshwater fishes

worldwide, 3,146 have been assessed by IUCN and 1,116 (7.4%) are considered threatened (Hogan, 2011). Recent reviews suggest that 40% of North American and 38% of European freshwater fishes are threatened (Kottelat and Freyhof, 2007) but lack of knowledge is still an issue. In addition, the Appendices I and II of the Convention on the Conservation of Migratory Species of Wild Animals (CMS) currently include only 21 species of freshwater fishes, predominately sturgeon species (Acipenseriformes), with 90% of these species listed on Appendix I. However, these data do not reflect the real status of most species. There is a lack of appropriate ecological information, particularly from Africa, Asia, and South American basins.

Are there 'invisible' species?

It is clear that migratory freshwater species include a wide spectrum of bionomic characteristics being their life cycles of many species still poorly known. Most of these species are not encompassed by ongoing initiatives, groups or forums, which are mainly directed at assessing and improving stocks of highly visible and commercially harvested species such as sturgeons, eels and salmonids (most of which occur in the northern hemisphere). While the development of specific expert groups is effective for the more emblematic species, they are not suitable for covering the majority of the lesser known migratory species inhabiting large number of basins; or for other large but less well known migratory species such as the giant Amazon catfishes that are becoming vulnerable to overfishing and potential river damming (Baigún, 2012). Thus, there is an increasing need to develop broader conservation strategies, encompassing species that have low visibility and limited commercial relevance. Ultimately, these contribute to natural fish species diversity and ecosystem functioning; and/or require sound protective measures from their socio-economic relevance to local communities.

Objectives of global working group

The issues outlined above call for effective actions and efforts to improve the conservation of migratory fish and their habitats. The creation, under the FFSG and CMS umbrella, of a Global Working Group on Freshwater Migratory Fish Species represents a sound strategy towards initiating steps to improving their conservation.



Gilded catfish (*Brachyplatystoma rousseauxii*) is an iconic species that develops reproductive migratory movements across the Amazon and Orinoco basins covering more than 3,000 km © Carlos Hoyos

The new group would aim to complement and work closely with other active networks/working groups focused on specific families (Anguillidae, Acipenseridae, etc.) with no intention to undermine or replace them. Data and recommendations provided by the GWGFMFS 'world group' would benefit conventions and international organizations concerned with the conservation and management of fish species and their habitats, such as: Convention on Migratory Species (CMS), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Convention on Biological Diversity (CBD), Food and Agriculture Organization (FAO), International Union for Conservation of Nature (IUCN), INFOFISH.

Specifically, the overall objectives of the group (being currently developed through consultation) could be to:

- a) Collate new baseline information about lesser known migratory fish species that may be threatened despite no formal or standard assessment being carried out.
- b) Provide a common platform to improve and share scientific and traditional knowledge and to highlight best conservation practices for migratory fish species.
- c) Promote and prioritize research on conservation issues and identification of appropriate mitigation measures based on current and future threats of target and not target species, particularly considering climate change scenarios, deteriorating water quality, overfishing, river fragmentation, critical habitat reduction, etc.
- d) Provide awareness of species that have not been considered important as target species, but

which could be adversely affected by anthropogenic impacts, including deteriorating water quality, river fragmentation, critical habitat reduction; thus decreasing riverine biodiversity.

e) Interact synergistically with existing networks/working groups (Salmonidae, Acipenseridae, etc.) to develop common strategies directed to increase public awareness of the relevance of migratory species and their potential vulnerability to degradation, and propose common guidelines and criteria to avoid population reductions.

f) Stimulate technical meetings, workshops and common scientific research focused on conservation problems and guidelines related to migratory species across continents.

g) Generate technical guidelines and communications materials that help biologists, fishery managers, NGOs, etc. to conduct migratory species assessments and understand the ecological relevance of developments and the potential threats.

h) Provide liaison with/support for IUCN Freshwater Biodiversity Unit and IUCN policy and strategy documents and Wetlands International programmes.

i) Develop technical and scientific documents that contribute to decision-making processes and management measures.

j) Develop transboundary monitoring and management programmes to generate information on life cycles, migratory patterns and population trends on migratory freshwater fish species.

Final Remarks

Conservation of migratory species, particularly those inhabiting transboundary rivers, represents a complex challenge. Many such species represent the basis of well-developed artisanal and recreational fisheries and are, therefore, evaluated to some degree. However, for the rest of the migratory species there is still a lack of sound biological and ecological information. The growing anthropogenic impacts from many different sources is increasing the risk of populations depletion and even species extinction. This view is evidenced by critical habitat reduction, principally in the large rivers.

The formation of a group of world experts working on migratory species has the potential to increase 'migratory species visibility'; and help to conserve those species that are ignored or which fall outside of regular conservation status assessments. Species-specific groups are valid and valuable strategies in this connection; but clearly a broader cross-cutting perspective is needed to solve or mitigate the general problems - particularly in those many regions where riverine ecological integrity is under threat.

Steps to be discussed at the next CMS meeting should be focused on determining how the global working group can become functional. By country or continent, it needs to be organized to optimize maintenance of fish diversity, human economic resources and positive interaction with other conservation organizations or entities.

Literature cited

- Baigún, C. 2012. Management implications for Dourada (*Brachyplatystoma rousseauxii*). In: *From sea to sources* (P. Gough, ed.). The Regional Water Authority Hunze en Aa's, The Netherlands: 146-147.
- Helfman, G. S. 2007. *Fish conservation. A guide to understand and restoring global aquatic biodiversity and fishery resources*. Island Press, Washington.
- Hogan, Z. 2011. *Review of freshwater fish. Convention of Migratory Species*. UNEP/CMS/Inf.10.33
- Kottelat, M. and Freyhof, J. 2007. *Handbook of European freshwater fishes*. Kottelat, Cornol, Switzerland and Freyhof, Berlin, Germany. 646p.
- Leveque, C., Oberdorff, T., Paugy, D., Stiasny, M.L.J., and Tedesco, P.A. 2008. Global diversity of fish (Pisces) in freshwater. *Hydrobiologia* 595: 545–567.
- Lucas, M.C. and Baras, E. 2001. *Migration of freshwater fishes*. Blackwell Science, Ltd., Oxford, 420p.
- UNEP-CMS. 2006. *Migratory Species and Climate Change: Impacts of a Changing Environment on Wild Animals* UNEP / CMS Secretariat, Bonn, Germany.



A chain of large dams have blocked migratory fish movements in basins such as the Parana, affecting fish biodiversity patterns and fisheries sustainability © Claudio Baigún

International Zoo Yearbook

Volume 47 | 2013



A special issue dedicated to the conservation of freshwater fishes with
Guest Editor, Professor Gordon McGregor Reid. Now available online [here](#)

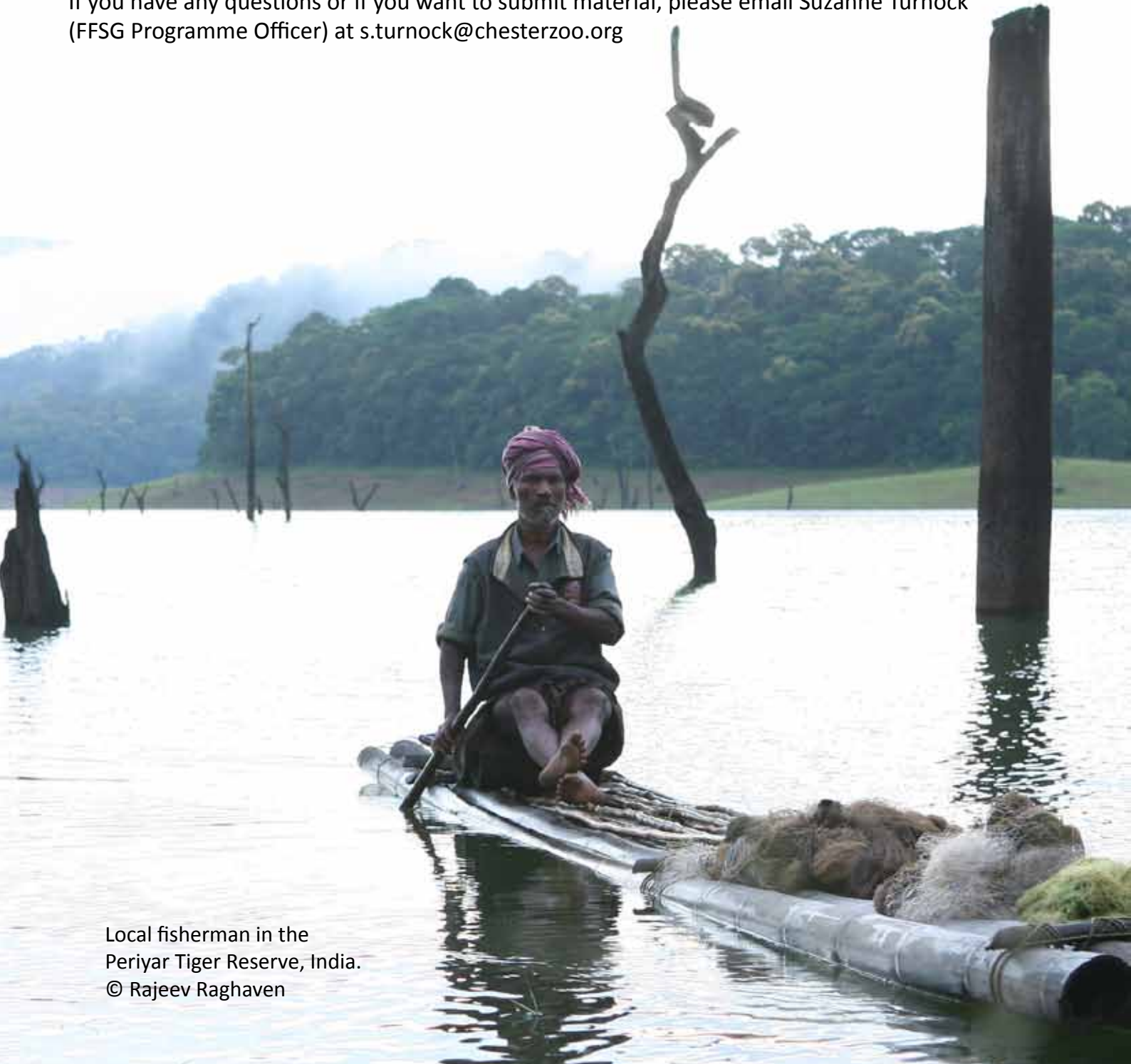
ZSL
LIVING CONSERVATION

NEXT ISSUE OF 'SAVING FRESHWATER FISHES AND HABITATS'

Do you want to share news from your freshwater fish conservation project with a global audience? Are you doing fascinating research or organising an exciting event? Well, the FFSG Newsletter could be the perfect way to tell your story!

The deadline for submitting material for the next issue is Friday 9th August.

If you have any questions or if you want to submit material, please email Suzanne Turnock (FFSG Programme Officer) at s.turnock@chesterzoo.org



Local fisherman in the
Periyar Tiger Reserve, India.
© Rajeev Raghaven



The IUCN SSC/WI Freshwater Fish Specialist Group is generously supported by Chester Zoo, UK (www.chesterzoo.org)