

SAVING FRESHWATER FISHES AND HABITATS

Newsletter of the IUCN SSC/WI Freshwater Fish Specialist Group

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Front cover image:
One of many events at
aquaria worldwide on
World Fish Migration
Day
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Message from the FFSG Global Chair

Dr Richard Sneider



Richard, Russel Mittermeier (President of Conservation International), and Simon Stuart (Chair of IUCN's SSC) at the 44th Annual Beastly Ball held at the LA Zoo and Botanical Gardens.

On Saturday June 14th the Los Angeles Zoo and Botanical Gardens held its 44th Annual Beastly Ball and we celebrated the 50th anniversary of IUCN's Red List of Threatened Species. I was delighted to be joined by Simon Stuart, the Chair of IUCN's Species Survival Commission, and by Russ Mittermeier, the President of Conservation International and a long-term associate of IUCN and much of its ground-breaking work. It was my greatest pleasure to be standing with Simon and Russ, not just as a Trustee of the Zoo, but also as the Chair of the FFSG, a truly remarkable and dedicated group of scientists, practitioners, and enthusiasts.

So, what does the Red List mean to us? Well – it is 'a key conservation tool' for assessing 'the state of the world's species.' I have deliberately chosen those phrases because they are taken from the chapter titles of the excellent, last large review of the Red List, *Wildlife in a Changing World* (http://cmsdata.iucn.org/downloads/wildlife_in_a_changing_world.pdf), prepared by Jean-Christophe Vié, Craig Hilton-Taylor and Simon Stuart from IUCN and published in 2009. If you haven't looked at that report yet, I encourage you to.

In the 5 years since that report was published, the Red List has continued to grow in taxonomic coverage and depth of content for each of the species included. It is, more than ever, widely recognized as the most comprehensive, objective, and reliable source of information for evaluating the conservation status of plant and animal species. The Red List contains information on over 73,000 species in total. Moreover, the list contains complete information for all known species of several major taxonomic groups including, for example, mammals, birds, amphibians, sharks and rays, crayfishes, freshwater crabs and shrimps, corals, mangroves, and seagrasses. Most species of freshwater eels have just been added to the Red List, as reported in this newsletter (p.7). The information in the Red List has been used for scientific understanding of the distribution and conservation status of species, and for conservation policy development from the global level down to the scale of individual sites. For example, the Red List was used by scientists to assess whether we, the global community, adequately met the targets set by the Convention on Biological Diversity on reducing the rate of biodiversity loss by 2010. We found we did not; and we have learned some important lessons from

this. As we move towards 2020 we have a bold new set of targets (the Aichi Biodiversity Targets, available at <http://www.cbd.int/sp/targets/>) and again, the Red List is a critical indicator for assessing our progress towards some of those targets.

And what about the representation of freshwater fishes in the Red List? In 2002 only 660 freshwater fishes (about 4% of all known species of freshwater fishes) were in the Red List. Now 7452 species are included (47% of all freshwater fish species). This is more than a tenfold increase in taxonomic coverage of freshwater fishes in the Red List, and it includes assessments of all known freshwater fish species for many parts of the world, including Africa, Europe, India, Mongolia, the Indo-Burma biodiversity hotspot, and the Arabian Peninsula. Significant progress is underway for North and parts of South America, New Zealand, Oceania, and Mexico. All this information can be used to give us a much clearer idea of the conservation status of freshwater fishes in many parts of the world, help us identify the most important regions for conservation action (freshwater 'Key Biodiversity Areas'), and target the most appropriate actions that must be implemented to address the threats to these species. Savrina Carrizo and her colleagues from IUCN's Freshwater Biodiversity Unit, based in Cambridge, UK, gave a thorough account of the progress towards a global assessment of the status of freshwater fishes for the IUCN Red List, and the application of this information to conservation programmes. Their work appeared in a volume of the International Zoo Yearbook, focused on *Freshwater Fishes and Their Conservation* (available at <http://onlinelibrary.wiley.com/doi/10.1111/izy.2013.47.issue-1/issuetoc>) that was coordinated by my predecessor as Chair of the FFSG, Prof. Gordon McGregor Reid.

Clearly, excellent progress has been made towards including freshwater fishes in the Red List. This has only been possible through the close collaboration of IUCN's Global Species Programme (in particular the Freshwater Biodiversity Unit, as well as the joint IUCN/CI Biodiversity Assessment Unit based in Virginia, USA) with the members of the FFSG. The Global Species Programme staff (and especially Will Darwall and Kevin Smith) have planned and coordinated the work for these assessments, including the final addition of the data into the Red List and the publication of the many reports (available at http://www.iucn.org/about/work/programmes/species/our_work/about_freshwater/resources_freshwater/) based on these data. Jamie Carr, in the Climate Change Unit based in Cambridge, is working hard to develop a process for assessing the vulnerability of freshwater species to climate change and, as he mentions in this newsletter, he needs our help to do this. Indeed, the FFSG has had, and will continue to have, a critical role in supporting the work of IUCN's Global Species Programme. The time-consuming assimilation and review of the data has required the expertise of many of the members of the FFSG, and the reports have been produced with extensive input from the FFSG.

There is still much to do, of course – we still have over 8000 species still to add to the Red List before we have full global coverage. More importantly, the data compiled thus far clearly shows we have many conservation challenges to meet. Of the 7452 species of freshwater fishes that have been assessed for the Red List, 1812 (over 24%) are ranked as threatened (CR, EN, VU). We must continue with our conservation efforts from global to local scales, we must strengthen our efforts to find funding to support the group, and we must look for partnerships that can help us achieve the conservation goals that we might not be able to meet on our own. So far this year we have already been busy on successful collaborative projects. Just to name a few projects, we are working in south Asia with the Mahseer Trust to conserve these magnificent fishes. Our freshwater BioBlitz project continues to attract important attention. And, lastly, the World Fish Migration Day was a huge success in inspiring people around the world to think more carefully about the ecological consequences of badly designed dams (see the report by Herman Wannigen in this newsletter, p.9).

Moving forward, we must explore opportunities for partnerships with zoos and aquariums around the world. This is something that Professor Gordon McGregor Reid had initiated in his role of Global Chair of FFSG, via his position as Director of Chester Zoo and as President of WAZA. I am anxious to continue this work, which is why I was especially pleased to have the Red List featured at LA Zoo's Beastly Ball, and to be present in my joint roles of Global Chair of FFSG as well as a Trustee of the Zoo. By forming partnerships between FFSG and zoos and aquariums we can link ex-situ and in-situ conservation efforts to enable a more complete approach to the protection of freshwater fishes and their habitats. FFSG can offer expertise on the ecology of species that might help with husbandry techniques and breeding programmes. FFSG and zoos can work together on identifying geographic and taxonomic priorities for in-situ conservation efforts, and in developing outreach materials to decision-makers and the general public.

We have done well, and I am proud to be the Chair of such an effective group – and I look forward to our future successes. As you will see below, we are back in a position where we can start planning our next FFSG meeting again; that will be our venue to review what our priorities will be for the next three or four years.



Richard Sneider
FFSG Global Chair



*From left: Simon Stuart (IUCN-SSC), Russell Mittermeier (President of CI), Betty White (co-Chair of the Board of Trustees of the Greater Los Angeles Zoo Association), Richard Sneider
Photo by Jamie Pham/Los Angeles Zoo.*

Changes to the FFSG Secretariat

Farewell to Suzanne Turnock



As most of you know Suzanne Turnock left her role of Programme Officer for the FFSG at the end of April this year. She had been with the FFSG for only a year, joining us when Kati Csatadi left on maternity leave, but she achieved an extraordinary amount in that year. Besides assisting Gordon McGregor Reid (our former global Chair), and Richard Sneider (or current global Chair) in the operation of the FFSG, she provided advice and guidance to Ian Harrison (our Technical Officer in support of Richard), revised our website, wrote articles for the FFSG newsletters over the last year, and lead on two very important projects for the FFSG. The first of those is the Freshwater Fish BioBlitz - which has amassed over 1200 observations in the five months since its launch. The second project is the World Fish Migration Day that was held on May 24, 2014, and was an enormous success (see the article on p. 9 in this newsletter). In addition to that Suzanne was active answering requests from within the FFSG and from the public.

Suzanne is moving on to a very exciting position as the Communications Manager for the Orangutan Tropical Peatland Project, working in the forests of Indonesian Borneo. She will doubtless do an excellent job for them, just as she has done for the FFSG. This job also allows her to once again indulge her love of fieldwork and to be working in Primate Conservation – a field in which she already has considerable experience.

All of us in FFSG are very grateful to Suzanne for the professional support, friendship, and personal initiative that she brought to the group and provided to us. We wish her the very best for the future and hope that some of us might have the opportunity of meeting her in the wetlands of Borneo at some time.

Welcome to Alex Mauroner

Alex Mauroner joined the Secretariat of the FFSG in June as the interim Programme Officer. We have six months of funding support for Alex to work part-time with the FFSG, while we continue our efforts to fundraise to support the Group.

Alex recently earned his Professional Science Master's in Environmental Science at Oregon State University, USA where he concentrated in Natural Resources. He received his B.A. in Biology from Westminster College, Missouri, USA. He has studied ecology in Belize and worked on leatherback turtle conservation in Grenada during his education. Recently he served as an intern for Conservation International's Alliance for Global Water Adaptation, working with Ian Harrison (Technical Officer for FFSG), and where he gained experience in science and policy work on climate adaptation, working for non-profits on environmental issues, and collaborating with experts and stakeholders across sectors.



Alex will be serving under the guidance of Dr. Richard Sneider and will be working closely with Ian on several aspects of FFSG operations, including fundraising, planning FFSG meetings, assisting with developing FFSG's priority activities, website outreach, and day-to-day operations of the Group.

Support from the Zoological Society of London (ZSL)

Alex Mauroner

FFSG Programme Officer



As indicated in David Jacoby & Matthew Gollock's article on the following page of this edition (see *Publication of the ASSG IUCN Red List Assessments*

on p. 7), the ZSL has played an essential role in supporting the recent Red List assessments of freshwater eels. In addition to this, members of the ZSL are among some of our most active. However, the FFSG gives special thanks to ZSL for its generous support towards the running costs of the FFSG over the last year and, in particular, for covering an important part of Suzanne Turnock's staff time in 2014.

The FFSG is a small organization with a challenging mission '*to achieve conservation and sustainable use of freshwater fishes and their habitats*'. Without the support of organisations such as ZSL, it would not be possible for us to reach our goals.

Founded in 1826, the ZSL (www.zsl.org) is an international scientific, conservation and educational charity whose mission is to promote and achieve the worldwide conservation of animals and their habitats. Their mission is realised through groundbreaking science, active conservation projects in more than 50 countries and their two zoos, ZSL London Zoo and ZSL Whipsnade Zoo.

Publication of the ASSG IUCN Red List Assessments: The first step towards the coordinated, international conservation of freshwater eels

David Jacoby & Matthew Gollock

Institute of Zoology/Conservations Programmes, Zoological Society of London, Regent's Park, London, NW1 4RY

Nobody ever said that this would be an easy task for the Anguillid Specialist Sub Group (ASSG) but neither of us realised quite what we were letting ourselves in for when, in March 2013, we took the first steps towards preparing IUCN Red List assessments for 13 of the 16 species of freshwater eel. Prior to this point, only four of the anguillids had been previously assessed, making this the most comprehensive assessment of anguillid species to date. Now, after nearly 15 months, 12 of these 13 assessments were published on the Red List this June, with the final species due to be uploaded in November.

In July 2013, the Zoological Society of London (ZSL) convened and hosted a workshop involving 16 experts from 8 different countries (see the FFSG Newsletter *Saving Freshwater Fishes and Habitats* Issue 3, March 2013). The objective was to draft assessments for all the anguillid species with the exception of those found in New Zealand which were being assessed as part of a larger freshwater fish project. The workshop was a great success and following several rounds of internal review amongst the workshop participants the assessments were circulated for wider review. The external review process was considerable, involving 64 detailed reviews from 30 different reviewers including representatives of the eel industry. As such, opinions varied, in some cases quite substantially, making this a good exercise, not just in conservation but in diplomacy also.

It was very clear during the workshop that there would be a number of challenges relating to assessing the anguillids; in relation to their life history, available data and the politics and economics associated with these species. Anguillid eels are a valuable resource, with consumption particularly high in Asia, but they are also strongly connected to indigenous culture in many parts of the world. In addition, all anguillids exhibit catadromy, have multiple life stages, are semelparous and panmictic. These life history traits make application of the Red List criteria considerably more challenging particularly in light of the broad threats to all of these species (Inc. changing ocean currents/climate change; industrial, urban and agricultural development; disease; exploitation; habitat loss, water abstraction and barriers to migration; mortality at hydropower pumps; pollution). We soon realised that transparency and broad representation from science, conservation and industry would be paramount to the success of these assessments.

Of the 12 published assessments, three species fell into a threatened category (the European eel *Anguilla anguilla*, Critically Endangered (CR); the Japanese eel, *A. japonica* Endangered (EN); the Borneo eel *Anguilla borneensis*, Vulnerable (VU)). Four of the remaining nine were Near Threatened (NT), two were Least Concern (LC) and there were three species from the tropics that were considered Data Deficient (DD) and thus a conservation priority. As with all the anguillid eels, there is no one single threat that would account for the status of the species, but rather a complex and dynamic synergy of those threats listed above. Indeed what extent each threat plays in influencing population dynamics in these species remains very unclear and clarifying this will be a key area for future research. These assessments, we feel, are the first step towards identifying these key areas for scientific and conservation focus.

While at face value the picture appears rather bleak, there are signs that recruitment of European and American (not published) glass eels to coastal environments have seen significant increases in the last few years. The situation for the European eel, which remains CR, does appear to be improving due to the development of national management plans in European Union (EU) range states. The species may well achieve a listing of EN in the future should improved management and increased recruitment continue. It also became apparent as the assessment process unfolded that East Asia is a hub for farming, trade and consumption of these species and the decline in the Japanese eel particularly has meant that trade of other anguillid species has grown. This was compounded by the export ban of the European eel outside



European Eel (Anguilla anguilla) was recently assessed as threatened thanks to new studies conducted by ASSG. Photo copyright David Curnick.

of the EU in 2010, and there is growing concern for certain tropical species which are considerably less well studied and most likely to be impacted by this shifting exploitation. The Japanese eel assessment has and continues to attract much media attention and there is obvious concern in Japan that a threatened listing on the IUCN Red List will influence changes in policy that will have knock-on effects to restaurants and businesses that rely on freshwater eels. Consequently, ZSL, the ASSG and regional experts are proposing a stakeholder workshop later in the year to discuss the status of this species and to encourage collaboration in conservation efforts between scientists, government, NGOs and industry. It is through the Red Listing process that we are beginning to build a strong, international network which will be crucial to any future conservation efforts both at home and abroad. To illustrate, ZSL has recently gained funding to lead on a project based in the Philippines in collaboration with TRAFFIC and in-country partners to address the status of five anguillid species found and exploited in the region. There will be a focus on working with local fisherfolk and ensuring exploitation is both ecologically sustainable and economically equitable.

We still know very little about many aspects of the eel's complex life history and for some species we have no data at all. It is important to highlight therefore that this first assessment is very much a starting point and reassessments after 5 – 10 years will be necessary as more data are gathered and technologies advance. For now, however, there are many aspects of this process and the outcome about which we can be cautiously optimistic and although this was a steep learning curve it has really highlighted the direction of ASSG efforts in the future.

World Fish Migration Day huge success!

Pao Fernandez (1), Kerry Brink (1), Herman Wannigen (1) & Gijs van der Linden (2) & Jeroen van Herk (2)

(1) Wannigen Water Consult & (2) LINKit Consult



The 24th of May 2014 marked the first ever World Fish Migration Day - a worldwide celebration of healthy rivers and free-running fish with over 270 events. On this day, well over 1000 different organisations contributed to WFMD2014, through support and/or participation, in over 50 countries worldwide. The primary aim of the celebrations, around the globe, was to raise awareness about the significance of migratory species of freshwater fishes, the many threats they face and the importance of healthy free flowing rivers.



Map showing number and global distribution of WFMD2014 events

The first celebrations started in New Zealand, with the official opening in Christchurch and finished off at an event in Hawaii. The majority of activities were educational activities suitable for the whole family. In total there were about 50 field excursions (river visits, kayak, fishway and boat trips); five fish migration festivals; 50 workshops, seminars and conferences; 15 events at zoos, museums and aquaria; eight Fish Passage visitor centres opening their doors; 10 official openings of fishways and dam removals, including the first ever dam removal project in Japan.



Children participating in WFMD event in Culmstock, England. Westcountry Rivers Trust, Photo by Paul Glendell

The concept of WFMD2014 was proudly initiated in The Netherlands, with the headquarters and coordination hub established in Amsterdam. In the build-up to WFMD2014, one of the largest fishways in Europe was officially opened in Italy (Isola Serafini, Piacenza) and a number of full week activities took place, including a film festival in The Netherlands. On the 24th of May 2014, 53 countries scattered across the globe opened their doors to over 27 000 people including local communities, children, policy makers, specialists and students. The events ranged from fun-filled river clean-ups in Poland to successful conferences in Spain, and marches in Ethiopia, open days for viewing bypass channels and releasing fish in the UK

and Paraguay. Here is some of the feedback received from the participants:

"1000s of people turned out to Denny & Dunipace gala yesterday" CATCA

"I hope everybody enjoyed the day as we did at the river Dosse!" Fario e.V.'s

"39 people and 60,000 alewives celebrate @WFMD2014 & revival of Blackman Stream, Penobscot River, Maine"
TNC

"More than 5000 people were involved in WFMD-2014 celebration in Russia. They learned a lot about fish and realized that the river should be free flowing for fish living safely in it." WWF Russia Amur branch partners.

In an effort to draw on this energy and to continue communication efforts, the WFMD2014 Partnership also launched World Fish Migration Platform (WFMP) on May 24th. The partnership includes Wanningen Water Consult, LINKit Consult, WWF, The Nature Conservancy and IUCN SSC/WI Freshwater Fish Specialist Group. The intention is to use WFMP to continue stimulating efforts to *Create Awareness, Share Knowledge* and *Build Solid Networks* on a global scale around the themes of fish migration and free-flowing rivers. Thanks to this platform we will all be able to assimilate, review and distribute crucial information (much of it not well known for many people), like updated data of dam removals in the world (almost 1200 dams have been removed in USA, 660 carried out since 1999), the opinions of experts on fishways, and much more.

However, this is just the beginning, the tip of the iceberg, the snowball just started rolling down the mountain: participants are already asking for the next WFMD..., so get ready for World Fish Migration Day 2016 (May 21st) because people all around the world are really going to be LOUD!

More information can be found at:

www.fishmigrationplatform.com and www.worldfishmigrationday.com



NatureServe becomes partner in Global Freshwater BioBlitz



Alex Mauroner
FFSG Programme Officer

NatureServe, a network connecting science with conservation based in the United States, has recently signed on to become a partner in the Global Freshwater BioBlitz project (www.iucnffsg.org/bioblitz). The NatureServe network is a public-private partnership that is comprised of more than 80 independent organizations throughout the Western Hemisphere. With their pledge of support there are now eight partners behind the BioBlitz.

Thus far, participants in the project have submitted over 1200 observations of freshwater fishes in their natural habitats from around the globe. NatureServe (www.natureserve.org) has reached out across its network to recommend that people submit their fish observation records to the BioBlitz website, which is being hosted by iNaturalist.org. Furthermore, NatureServe partners are helping to spread the word about the Global Freshwater BioBlitz to their fellow researchers working on fish collection data.

Though the addition of a new partner organization is good news, we still need everyone's support on this project. The more people "on the ground" carrying out observations and recording what they have seen, the better. Information from the Global Freshwater BioBlitz has the potential to assist scientists to describe new species, help assess the risk of extinction for the IUCN Red List of Threatened Species, track the spread of invasive species and these data can be exported to freely accessible online data archives, such as Encyclopedia of Life.

You can also help us by raising the profile of the Global Freshwater Fish BioBlitz and getting more people involved. Tell your friends, families and colleagues about the BioBlitz (e.g. through social media, word of mouth, email, etc.).

If you have any questions about the BioBlitz, please email us at info@iucnffsg.org



Global Freshwater Fish BioBlitz

Assessing the vulnerability of freshwater fishes to climate change

Han Meng and Jamie Carr

IUCN Global Species Programme; Climate Change Unit

There is increasing evidence and documentation of the impacts of climate change on biodiversity, and in many cases these impacts are negative in nature. It is, therefore, essential that conservation efforts take into account how species and systems will be affected by changes in the climate. As a response to this need, the IUCN Global Species Programme's Climate Change Unit (CCU) has been developing a system of assessing individual species' vulnerability to climate change, based on their biological and ecological traits. In addition to quantifying the anticipated changes in climate across each species' range, the system also looks at traits that could make a species more or less sensitive to change, as well as traits that make species less able to adapt. Species that are highly sensitive, poorly able to adapt, and expected to be exposed to large changes are considered the most vulnerable overall (Figure 1). Trait data are typically based on experts' knowledge and judgements, as well as from the literature. These assessments are designed to complement Red List assessments, by considering this additional emerging threat.

The approach was originally developed by Wendy Foden (former leader of CCU) and colleagues, who applied it globally to the world's birds, amphibians and corals (about 17,000 species overall; Foden et al., 2013). More recently the CCU has been developing the approach so that it can be applied to a wider range of species groups, including those from the freshwater realm. In terms of freshwater fish, the methods have so far been applied to species of East/Central Africa's Albertine Rift (Carr *et al.*, 2013), as well as to all species of West Africa (Carr *et al.*, 2014). The CCU is now in the process of applying the assessment framework to freshwater fish species of the Tropical Andes (see FFSG Newsletter Issue 4, March 2014 for more info on this project). Having recently taken part in a species assessment workshop in Lima, Peru, to consider species of Peru and Bolivia, they are now making preparations for a second workshop to consider the species of Ecuador and Colombia.

The implemented assessments described above have considered species traits that were identified by a range of freshwater fish experts, including several members of the FFSG. The traits used include: dependency upon particular microhabitats (e.g. rapids, submerged roots, temporary pools etc.), use of visual intraspecific recognition systems, and dependence upon a weather variable (e.g. temperature) to initiate egg development, among many others. Despite some great contributions from numerous experts, the CCU still feels that work remains to develop the approach for assessing freshwater fish (as well as other freshwater taxa). **The CCU would like to hear from FFSG members about their climate-related observations and suggestions for assessment traits, and will endeavour to work these into their assessment framework.** With the inputs of knowledgeable experts, their aim is to develop a globally-applicable approach that is endorsed by the FFSG, and to use it to conduct meaningful, robust assessments that can facilitate successful conservation of freshwater fish in a rapidly changing world.

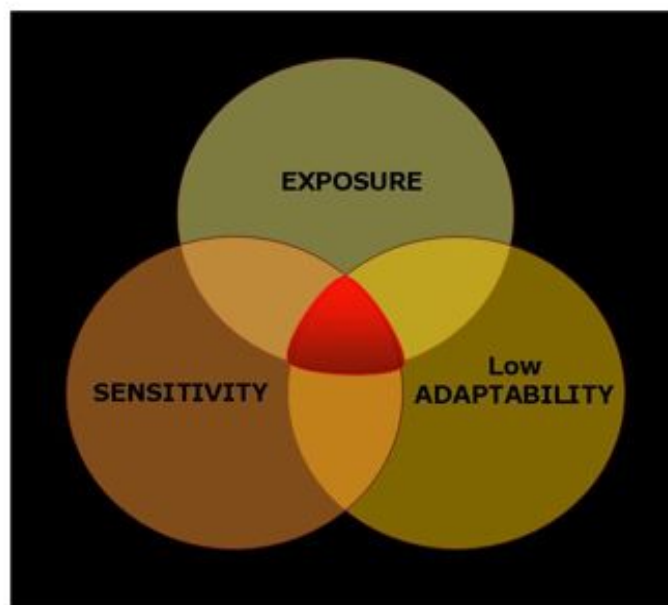


Figure 1: Schematic diagram showing the three dimensions of climate change vulnerability.

For more information on any of the topics covered in this article, or to provide your own thoughts on climate change impacts on freshwater fish, please contact Jamie Carr (jamie.carr@iucn.org) or Han Meng (han.meng@iucn.org)



Figure 2: Participants at the species assessment workshop in Lima, Peru, earlier this year.

References

Carr, J.A., Outhwaite, W.E., Goodman, G.L., Oldfield, T.E.E. & Foden, W.B. (2013). Vital but vulnerable: Climate change vulnerability and human use of wildlife in Africa's Albertine Rift. *Occasional Paper of the IUCN Species Survival Commission No. 48*. IUCN, Gland, Switzerland and Cambridge, UK. Xii+224pp. <http://www.iucn.org/dbtw-wpd/edocs/SSC-OP-048.pdf>.

Carr, J.A., Hughes, A.F. & Foden, W.B. (2014). A Climate Change Vulnerability Assessment of West African Species. UNEP-WCMC technical report. <http://www.parcc-web.org/parcc-project/documents/2014/04/carr-et-al-2014-a-climate-change-vulnerability-assessment-of-west-african-species-main-report-unesp-wcmc-technical-report.pdf>

Foden, W.B., Butchart, S.H.M., Stuart, S.N., Vié, J.-C., Akcakaya, H.R., Angulo, A., DeVantier, L.M., Gutsche, A., Turak, E., Cao, L., Donner, S.D., Katariya, V., Bernard, R., Holland, R.A., Hughes, A.F., O'Hanlon S.E., Garnett, S.T., Şekercioğlu, C.H., & Mace, G.M. (2013) Identifying the World's Most Climate Change Vulnerable Species: A Systematic Trait-Based Assessment of all Birds, Amphibians and Corals. *PLoS ONE* 8(6): e65427. doi:10.1371/journal.pone.0065427

LIFE+ SEGURA RIVERLINK, implementing a *green infrastructure* approach to restore the longitudinal connectivity for the endemic Southern Iberian barbel in a highly fragmented river basin

Eduardo Lafuente Sacristán

Hydrology and River Restoration, Spain Environmental Ministry



The Segura River Basin, located in the south east of Spain, is considered to be the driest basin in Spain with a mean annual precipitation of 300 mm. The area covered by this Mediterranean basin has historically experienced significant climatic extremes and water imbalances, going from prolonged droughts (cycles go from 2 to 5 years) to torrential rains and extraordinary flash-floods (200 mm of rain in a few hours). This spatial and seasonal variability has for centuries led to efforts to control the river in order to make use of it for human activity. As a result, the Segura River is one of the most regulated rivers in Europe and one of the few rivers that is dry before even reaching the sea. This human intervention has significantly altered the water flow regimes throughout the basin, creating severe environmental problems and breaking connectivity.

The Water Framework Directive has produced a substantial change in the principles of water management and its application to water systems implies those systems must be kept in good status through a rational and sustainable management of water: “It must be a rare, if not unique, experience for a nationally important European river to be transformed within ten years from the most polluted to the best quality in its homeland,

but that can be said of the Segura in south-eastern Spain,” (*Water21*, August 2012, available at <http://www.tecniberia.es/documentos/WaterReuseBringslifeWaterXXi.pdf>).

The LIFE + SEGURA RIVERLINK project, co-financed by the LIFE Program of the European Union, aims to promote and support the environmental recovery of the Segura River Basin by improving and strengthening the connectivity between natural ecosystems, promoting the conservation of an area of exceptional environmental value and improving its public use. The partners involved in the project include administrations, universities and an environmental NGO: namely, Segura River Basin Authority as the project coordinator, Regional Authority of Murcia Region, University of Murcia, ITAGRA and ANSE.

The main actions include the removal of an unused weir and the construction of eight fish passages in an important stretch of the Segura River that intersects sites included in the Nature 2000 Network. It is important to note that this a pilot experience in the Segura River Basin and a still uncommon practice in Mediterranean areas. To support these actions, ecological restorations will be implemented in each demonstration site.

The target species of the project is the *Luciobarbus sclateri* (Southern Iberian barbel), an Iberian endemic and the only autochthonous species in the project. The other sentinel species are *Pseudochondrostoma polylepis* (Iberian nase), *Gobio lozanoi* (Pyrenean gudgeon), and *Alburnus alburnus* (Bleak). A number of exotic species such as *Gambusia holbrooki*, *Cyprinus carpio*, *Sander lucioperca*, and *Lepomis gibbosus* can also be found in the river stretches contained within the study area.

Monitoring activities will assess the performance of these actions (weir removal and construction of fish passages) with the hope of validating the *Green Infrastructure* approach to river basin management and its possible extension to the official River Basin Management Plan of the Segura River Basin. The project also includes the creation of a Land Custody Network that seeks to involve different stakeholders in the river management as well as an Environmental Educational Program and a Volunteering Program to promote environmental awareness in society. This project will protect local aquatic and riverine habitats, allow fish migration along an important sector of the Segura River, improve ecosystem services, build a cadre of scientific and social knowledge to improve river management quality and help local and regional governments to comply with the EU Water Framework Directive, and facilitate the implementation and enforcement of EU policy and legislation on biodiversity conservation.

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Luciobarbus sclateri (Southern Iberian barbel)



Weir demolition in the Moratalla River

Halting the loss of biodiversity – the huchen in the Danube

Zoran Marčić, Danilo Mrdak, Dragana Milošević, Predrag Simonović, Marina Piria, Belma Kalamujić, Steven Weiss & Jörg Freyhof



The Convention of Biological Diversity (CBD) and the Biodiversity Strategy of the European Union (EU) set ambitious targets to be achieved by 2020. CBD asks for a considerable reduction in the loss of biodiversity and the EU aims to halt this loss and even restore degraded biodiversity. While many ongoing activities aim to reach these goals, there is still a long way to go and governments are asked to intensify their efforts. Whereas, we are experiencing a tsunami of new hydropower plant constructions that severely impact ecosystems, their biodiversity and services. The future of rivers does not look bright in Europe and elsewhere.

Among the most prominent species suffering from these developments is the huchen or Danube salmon *Hucho hucho*. This species, among the world's largest salmonid fishes, is very sensitive to ecosystem alteration by hydropower development. Several major populations have been extirpated as rivers are transformed into chains of reservoirs and there is a steady ongoing decline in population abundance. The huchen is dependent on riverine habitat, which is lost when reservoirs or even chains of reservoirs are constructed. Therefore, fish passes do not help, because they do not replace lost riverine habitat. The huchen has been assessed as Endangered in the IUCN Red List since 1990, and is protected under the EU Habitats Directive as well as all national legislation.

The Balkan rivers constitute the remaining global stronghold of the huchen. There are still several large and minimally impacted rivers flowing from the Dinaric Mountains that harbour the species, but our knowledge on the actual

distribution and conservation status of each population in the region is insufficient to identify core conservation areas. To rectify these knowledge deficits, the Faculty of Science, Zagreb (Zoran Marčić), the Faculty of Teacher Education, Zagreb (Marko Čaleta), IUCN FFSG (Jörg Freyhof) and IUCN Salmonid Specialist Group (Steven Weiss) organized a workshop to assess and discuss the distribution and conservation status of *Hucho hucho*. Altogether, 17 experts from seven countries (Germany, Austria, Slovenia, Croatia, Serbia, Bosnia and Herzegovina, and Montenegro) came together at the Ecological Station of the Department of Biology of the Faculty of Science in Zagreb between the 13th-15th May 2014 in Ježević, Croatia to discuss future monitoring guidelines and potential projects or conservation campaigns. The workshop is part of the “Save the Blue Heart of Europe” Initiative (<http://www.balkanrivers.net>).

During the workshop, it became obvious that the Balkan region still harbors a number of sustainable populations of huchen, but many suffer from illegal fishing or have been recently lost through hydropower plant development. Significant threats not only come from large dams but also from fast developing so called “micro” hydropower plants, constructed in smaller tributaries, which are often valuable spawning and rearing habitat for huchen. While low population abundance due to overfishing can be quickly resolved through proper management, the massive consequences of unlimited hydropower expansion, if carried out as envisioned would mean the end of most Huchen populations of huchen. All participants agreed that the negative impacts of hydropower development are difficult to mitigate and we need future research to assess the possibilities for biodiversity offsets in conservation of huchen. The outcome of the workshop will be summarized in a publication paving the way for legislative harmonization and successful conservation management of this species.

Almost all freshwater fish species of the Mediterranean Biodiversity Hotspot barcoded

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(*Oxynoemacheilus* sp., an undescribed loach from the smallest Mediterranean endemism hotspot, the Turkish Sultan marshes. Five freshwater fish species occur in this marsh and Geiger *et al.* (2014) show that all are endemic but three are still undescribed. Photo by Jörg Freyhof)

Incomplete knowledge of biodiversity remains a stumbling block for conservation planning and even occurs within globally important Biodiversity Hotspots. Although technical advances have boosted the power of molecular biodiversity assessments, only North American and Australian freshwater fishes have been comprehensively barcoded to build up a reference library. Geiger *et al.* (2014) present an analysis of the first DNA barcode library for the freshwater fish fauna of the Mediterranean biodiversity hotspot (526 species), with virtually complete species coverage (498 species, 95% of extant species). Overall, genetic morphological discontinuities suggest the existence of up to 64 previously unrecognized candidate species. The authors found reduced identification accuracy when using the entire DNA-barcode database, compared with analyses on databases for individual river catchments. This scale effect has important implications for barcoding assessments and suggests that fairly simple identification pipelines provide sufficient resolution in local applications. Geiger *et al.* (2014) calculated Evolutionarily Distinct and Globally Endangered scores in order to identify candidate species for conservation priority and argue that the evolutionary content of barcode data can be used to detect priority species for future IUCN assessments. Geiger *et al.* (2014) also present an up to date taxonomy of all species in the trees shown, suggest some taxonomic changes, revalidate several species and provide a new list of all Mediterranean freshwater fish species including a list of species likely to be extinct in the area. They also show that large-scale barcoding inventories of complex biotas are feasible and contribute directly to the evaluation of conservation priorities.

References

Geiger, M.F., Herder, F., Monaghan, M.T., Almada, V., Barbieri, R., Bariche, M., Berrebi, P., Bohlen, J., Casal-Lopez, M., Delmastro, G.B., Denys, G.P.J., Dettai, A., Doadrio, I., Kalogianni, E., Kärst, H., Kottelat, M., Kovačić, M., Laporte, M., Lorenzoni, M., Marčić, Z., Özuluğ, M., Perdices, A., Perea, S., Persat, H., Porcelotti, S., Puzzi, C., Robalo, J., Šanda, R., Schneider, M., Šlechtová, V., Stoumboudi, M., Walter, S., & Freyhof, J. (2014). Spatial heterogeneity in the Mediterranean Biodiversity Hotspot affects barcoding accuracy of its freshwater fishes. <http://onlinelibrary.wiley.com/doi/10.1111/1755-0998.12257/pdf>

New *Valencia* from Greece: Likely to be Critically Endangered and a high ranked EDGE species

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Valencia robertae, the newly described killifish species from southern Greece. Photo by Jörg Freyhof.

The killifishes of the family Valenciidae are the only fish family endemic to Europe and the Mediterranean basin, and the recent description of a new member brings the total number of species to three. This trio forms the family's only genus *Valencia*; all species have very restricted natural ranges, within which they have been subjected to extensive habitat degradation and competition with introduced species. The two previously described species, *V. hispanica* and *V. letourneuxi* are ranked as Critically-Endangered. *Valencia hispanica* is found only in a handful of localities along the Mediterranean coastline of Spain and *V. letourneuxi* occurs in a few sites in northwestern Greece and southern Albania. Geiger *et al.* (2014) have calculated the EDGE scores for almost all Mediterranean freshwater fishes, and species of *Valencia*'s represent the species with the highest EDGE scores. This means that species of *Valencia* are within the group of species with the highest conservation priority if we follow the philosophy of EDGE. The newly described *Valencia robertae* (Freyhof *et al.*, 2014) is also expected to be Critically Endangered and joins the EDGE group of highest conservation priority. This makes the conservation situation for *V. letourneuxi* even worse, as one of the most important populations has now been split from this species (and recognized as a discrete species, *V. robertae*). *Valencia robertae* was known from three sites but is actually known with certainty only from the lower Mornos River in mainland Greece. It is already extirpated in the Alfios River and might be extirpated at the type locality at the lower Pinios River in Peloponnes and the species is indeed described based on captive fishes from a stock collected in the 1990s.

References

Freyhof, J., H. Kärst & M. Geiger, 2014. *Valencia robertae*, a new killifish from southern Greece (Cyprinodontiformes: Valenciidae). *Ichthyological Exploration of Freshwaters* 24 (4): 289-298. http://www.pfeil-verlag.de/04biol/pdf/ief24_4_01.pdf

Geiger, M.F., Herder, F., Monaghan, M.T., Almada, V., Barbieri, R., Bariche, M., Berrebi, P., Bohlen, J., Casal-Lopez, M., Delmastro, G.B., Denys, G.P.J., Dettai, A., Doadrio, I., Kalogianni, E., Kärst, H., Kottelat, M., Kovačić, M., Laporte, M., Lorenzoni, M., Marčić, Z., Özuluğ, M., Perdices, A., Perea, S., Persat, H., Porcelotti, S., Puzzi, C., Robalo, J., Šanda, R., Schneider, M., Šlechtová, V., Stoumboudi, M., Walter, S., & Freyhof, J. (2014). Spatial heterogeneity in the Mediterranean Biodiversity Hotspot affects barcoding accuracy of its freshwater fishes.

Back from the dead - *Acanthobrama telavivensis* returns to nature

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Acanthobrama telavivensis has recently returned to nature but is still classified as Vulnerable. Photo by Menachem Goren.

The Yarqon bleak, *Acanthobrama telavivensis* (Cyprinidae) is a small, dullish fish species endemic to the rivers flowing to the Mediterranean coast in Israel. It was probably the most abundant fish in these small rivers until the 1950s. An increasing number of rivers then dried out due to the over-abstraction of water for various reasons. In autumn 1999, following a drought, only two populations of the Yarqon bleak remained, both on the brink of extinction. About 150 fish from two rivers (Yarqon River and Tut stream) were rescued a few days before the rivers completely desiccated. These fishes were brought to the Ichthyological Laboratory at Tel Aviv University. They were carefully treated and housed in a purpose-built breeding center. Within five years, more than 14,000 fish had been produced. Concomitantly, an intensive study was carried out on various aspects of the fish biology.

During this latter period, the government acknowledged nature's rights to water. Consequently, the requirements of aquatic habitats became a significant concern in any plan affecting these habitats. In addition, the availability of fresh water has increased and is still increasing due to the wide-scale use of recycled waste water and desalination projects.

During winter 2002/2003 about 5,000 adult, captive-bred fishes were returned to the Yarqon River. Surveys carried out in 2004 revealed that, although the reintroduced fish had survived and were in good body condition, not even a single juvenile was found. At that time it was not clear whether the reason was the water quality or the lack of suitable habitats for reproduction. To solve this dilemma, an experimental pond of ca. 400 m² was built alongside the upper part of the Yarqon River. The pond was fed by water pumped directly from the river and passed through a small mesh net to prevent the introduction of other fishes, such as *Gambusia*, eels and catfish. Following the knowledge acquired in the laboratory, the habitat was engineered to meet fish needs (suitable substrate for spawning, submerged and riverbank vegetation that provided shelter for post-larvae and juveniles, etc.). The pond was stocked with laboratory-born Yarqon bleak. These fish produced thousands of juveniles. Following this success, in 2006 ca. 9,000 fish were stocked in ca. 12 rehabilitated natural sites and artificial ponds. At most sites minimum water flow was promised by the authorities, while at others water quality has improved; and at most sites certain habitat-engineering activities were carried out. The descendants of these Yarqon fishes were introduced into water bodies in the Yarqon vicinity, while the fish originating from the Tut River were introduced into central and northern streams.

During the period 2007 to 2013, most of these stocked habitats, monitored by the Israel Nature and Parks Authority, revealed large populations of assorted sizes and ages. Many of the juveniles found in 2012/2013 are thus fifth-

generation offspring. Hence, *Acanthobrama telavivensis* has returned to nature. Nonetheless, considering the ecological status of the coastal rivers in Israel, it is categorized as 'vulnerable'.

The success in saving and returning the Yarqon bleak to nature can be attributed to the combined impact of increased awareness and commitment of the various governmental agencies regarding the health of aquatic habitats in Israel (although the state of most of them is still bad), to the extensive research that accompanied the project, and to the dramatic increase in availability of alternative sources of water (desalinized and recycled) that enable the reduction of pressure on natural water resources.

Additional details in:

- Goren, M. 2009. Saving critically endangered fish species – utopia or practical idea? The story of the Yarqon bleak- *Acanthobrama telavivensis* (Cyprinidae) as a test case. *Aqua, International Journal of Ichthyology* **15** (1): 1-12.
- Goren, M. 2011. Re-introduction of the "Extinct in the Wild" Yarqon bleak- *Acanthobrama telavivensis* (Cyprinidae). In: Soorae, P.P., ed. Global re-introduction perspectives: Re-introduction case studies from around the globe: 45-48. IUCN/SSC Re-introduction Specialist Group.
- Goren M. 2012. The Fall and Rise of the Yarqon Bleak. *WAZA (World Association of Zoos and Aquaria)* **13**: 36-38.

Updates from Manipur: The International Symposium on River Biodiversity

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International Symposium on River Biodiversity: Ganges-Brahmaputra-Meghna (GBM) River System

The International Symposium on River Biodiversity: Ganges-Brahmaputra-Meghna (GBM) River System was held in Patna, India from April 4-6, 2014. The symposium was sponsored by IUCN and jointly organized by Patna University (India) and the University of Chittagong (Bangladesh) at Hotel Maurya, Patna, India. About 40 invited speakers presented papers in six technical sessions comprising Higher Vertebrates, Fish and Fisheries, River Morphology, Water Quality, Stakeholders and Community Participation and Plankton and Benthic organisms. More than 20 posters were also presented.

Prof. W. Vishwanath, South Asia Regional Co-Chair for IUCN-FFSG delivered a lecture on the freshwater fish diversity of the Ganga-Brahmaputra-Meghna basin and their conservation status. He also chaired the Fish Diversity Session.

One of the recommendations of the symposium was: Taxonomic and Biological Study of Aquatic organisms (including fish), and a time to time assessment of their threat status so that conservation actions may be focused on the species under threat.



FFSG's South Asia Regional Co-Chair, Vishwanath Waikhom, presents at International Symposium on River Biodiversity



FFSG ANNUAL MEETING UPDATE



Please mark your calendars for this year's annual meeting, which was initially scheduled for March but had to be rescheduled due to logistical conflicts. Planning has been contingent on funding, so some specifics have not been finalized.

When: Two to three days , expected during the week 7-12 December 2014

Where: Cuernavaca, Mexico

Topics to be Discussed: Fundraising, procedures for assigning regional chairs, review of regional boundaries, priorities for 2015-16, review of FFSG Programs (World Fish Migration Day follow-up, status of Global Freshwater BioBlitz), review of freshwater outputs from World Parks Congress,

Funding: Partial funding support from IUCN-SSC; additional funding being negotiated

PLEASE NOTE: The meeting is still on for December. Further details will be provided to FFSG members within the next month, so check your email and the FFSG website (<http://www.iucnffsg.org/ffsg-activities-2/ffsg-meetings/>) for more updates. Thank you for your patience!



World Parks Congress Early Bird Deadline Fast Approaching



Register now to save big on this year's WPC! Early bird registration closes 30 June 2014, after which the discounted rate will no longer be available. You won't want to miss out on this year's Congress in beautiful Sydney, Australia. Visit the event's website (<http://worldparkscongress.org/index.html>) to register or find out more about.



IUCN
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The IUCN World Parks Congress 2014 is a landmark global forum on protected areas. The Congress will share knowledge and innovation, setting the agenda for protected areas conservation for the decade to come. Building on the theme "*Parks, people, planet: inspiring solutions*", it will present, discuss and create original approaches for conservation and development, helping to address the gap in the conservation and sustainable development agenda.

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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 15th August 2014.

If you have any questions or if you want to submit material, please email info@iucnffsg.org



Doring River, Western Cape,
South Africa © Bruce Paxton

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