



# Newsletter

## ISSUE No. 5

### Data, data and more data!

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Could you imagine, how the world would be a better place, if all biodiversity data would be publically available? Political decisions would no longer be made on a small scale and policy makers, environmental agencies and regional scientists would need to think outside of the box. If we had data available and of high quality standards, many questions could be answered on different scales and it would lead to a real difference in conservation and human welfare. Additionally, scientists could discover more about how our biosphere functions and how fantastic and curious the world around us is organised. Foremost, scientific results published could be re-analysed independently giving science a much higher creditability.

This current issue of the BioFresh newsletter is focused on the efforts of the BioFresh team to collect, and assemble freshwater biodiversity data - a hot debated issue in biodiversity science and policy.

While huge amounts of data are collected annually, only a very small fraction of those are made publically available. This is partly due to the fact that most field biologists and scientists do not know where to go with their data. Changing this situation is one of the key goals of the FP7 project BioFresh, which deals with it in three ways.

BioFresh strongly encourages scientists to publish data parallel to the submission of scientific papers. Here, we report on this development and we also explain and highlight the option of so-called data paper publications.

To access data crucial for the scientific work packages, BioFresh supports data owners through the BioFresh data acquisition fund. This money is dedicated to the mobilisation and digitisation of data. Funded activities concern mostly occurrence data, taxa lists and crucial background data. Up to now 19 projects are supported by BioFresh of which 11 report about their story and success in this newsletter.

Finally, BioFresh offers the necessary facilities to make data publically available by describing them in the BioFresh metadatabase, where important freshwater biodiversity data sources globally available are (and will be) registered. Naturally, BioFresh aims to include real data into the BioFresh data portal and we encourage all data owners to do so. In this newsletter you will find how you can contribute to the BioFresh data publication efforts, what data papers are and what scientists and data owners gain from them.

Jörg Freyhof, IGB  
Astrid Schmidt-Kloiber, BOKU  
Aaike De Wever, RBINS

## Freshwater journal initiative

### Editors encourage the publication of basic biodiversity data

Last year, during the 7th Symposium on European Freshwater Sciences (SEFS) in Girona, we had a unique opportunity to meet with editors and representatives from eleven journals. As BioFresh strives to encourage scientists and data holders of freshwater data to publish their primary biodiversity data in a public (web) domain, we believe that journal editors may play an important role in stimulating this practice, as is the case for sequence data on EMBL/GenBank/DDBJ.

During this meeting we developed the following statement, which meanwhile is widely published in the instructions for authors and on the journals' websites: *"Authors are encouraged to place all species distribution records in a publicly accessible database such as the national Global Biodiversity Information Facility (GBIF) nodes ([www.gbif.org](http://www.gbif.org)) or data centres endorsed by GBIF, including BioFresh ([www.freshwaterbiodiversity.eu](http://www.freshwaterbiodiversity.eu))."*

At this stage, this statement has been approved by the editors and publishers of the following journals: *Aquatic Botany, Aquatic Conservation: Marine and Freshwater Ecosystems, Aquatic Ecology, Aquatic Sciences, Canadian Journal of Fisheries and Aquatic Sciences, Ecology of Freshwater Fish, Freshwater Biology, Freshwater Reviews, Freshwater Science (Journal of the North American Benthological Society until January 2012), Fundamental and Applied Limnology, Hydrobiologia, Inland Waters, International Review of Hydrobiology, Journal of Fish Biology, Journal of Plankton*

*Research, Limnetica, Limnologia, Marine and Freshwater Research and River Systems.* Discussions are in progress with nine additional major journals in the field.

To further promote these efforts of encouraging data publication, we published a Viewpoint letter in BioScience entitled: "Freshwater Journals Unite to Boost Primary Biodiversity Data Publication" and updated the instructions on our website to explain the workflow on how to contribute data (see links below as well as the following article).

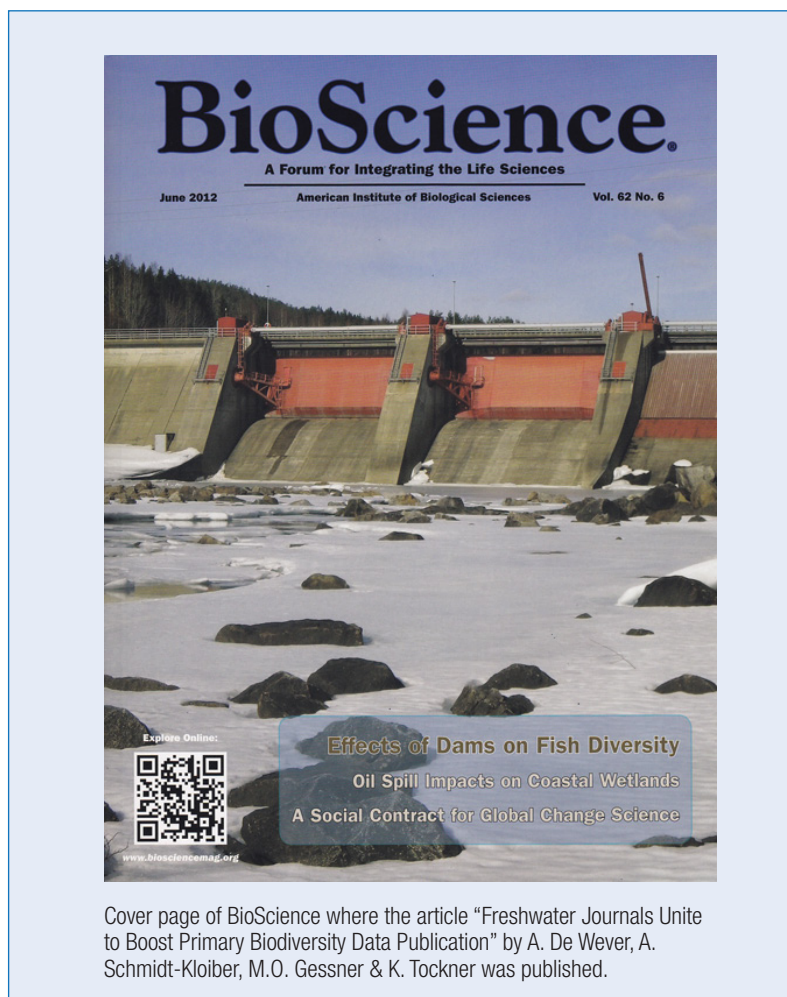
The benefits to scientists following these recommendations

lie in the increased visibility and recognition of their work, which may lead to future collaborations. Further, papers connected to publically available data are cited significantly more often.

Further reading:

- ➔ <http://www.jstor.org/stable/10.1525/bio.2012.62.6.2>
- ➔ <http://data.freshwaterbiodiversity.eu/supportbiofresh.html>
- ➔ <http://data.freshwaterbiodiversity.eu/submitdata.html>

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## Insights into the BioFresh data publication effort

### How can you contribute?

**B**ioFresh is constantly searching for freshwater biodiversity databases for both completing its metadata-base and for publishing the data on its data portal.

BioFresh invites you, scientists, NGOs and other persons/institutions, to help to reach the global goal of making (freshwater biodiversity) data publicly available (as e.g. legally claimed for by the Aarhus Convention, the OECD Principles and Guidelines for Access to Research Data from Public Funding or the INSPIRE initiative) by publishing your data through the BioFresh data portal.

This will lead to high visibility for your datasets and furthermore to synergies as for example automated backups of your data or the possibility to display your own occurrence records on

maps. In addition we will offer full acknowledgements on the portal and provide clear citation guidelines for users consulting your data. You will be asked to characterise your dataset in the BioFresh metadatabase where you can specify the intellectual property rights as needed.

There is a wide range of input we are looking for. Consider the options below on how you might contribute to BioFresh:

- **Alert us about the existence of a database and have it documented in the BioFresh metadatabase**

- **Submit/publish primary biodiversity data used in a scientific paper**

- **Make a dataset available through the publication of a data paper**

- **Other options including linking to web resources, data archiving,...**

Contact us:

➔ [data@freshwaterbiodiversity.eu](mailto:data@freshwaterbiodiversity.eu)

Explain which dataset(s) you hold and how you would like to make them visible through BioFresh.

Please refer to the following detailed description for more information:

➔ <http://data.freshwaterbiodiversity.eu/supportbiofresh.html#howtocontrib>

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Screenshots of the BioFresh websites where you can learn more about contributing and publishing data (<http://data.freshwaterbiodiversity.eu/>).



## About data papers and archiving initiatives

Making datasets discoverable through the meta-database and publishing them on-line is one of the main aims of the BioFresh project. A fair amount of the datasets documented in the metadatabase seems highly suitable for a 'data paper'. A number of data papers is currently being prepared by BioFresh partners, but we encourage anyone holding freshwater related databases to consider this option for publishing data.

By 'metadata paper' or 'database paper', we refer to a paper that basically focuses on the description of a database, sketching the history, value and usefulness of the dataset for fellow scientists. As publishing such a paper offers a clear way for others to cite the dataset unambiguously it may be an interesting approach to convince collaborators and/or data suppliers of compiled datasets to make their data (or an extract of it) publicly available. Such papers could be conceived as either a pure description of the dataset and targeted at a specialised journal (e.g. ZooKeys and PhytoKeys) or as a more extensive scientific

article giving a broad insight in the database targeted at a regular scientific journal.

A 'pure' data paper could be limited to an abstract published in a scientific journal together with descriptive and technical metadata and (a) data file(s) available on-line as is the case for the papers in ESA Ecological archive (see two examples below). Similarly, Pensoft Publishers recently started calling for data papers based on primary biodiversity datasets published to GBIF (Penev et al. 2011). Other emerging initiatives include Dataset Papers in Ecology.

In its publishing tool (IPT), GBIF is providing the possibility to generate a draft paper outline containing the metadata information of the dataset. BioFresh is currently adding similar export functionalities to its metadatabase.

Another big data archiving initiative, which is however not exclusively targeted towards data papers or (freshwater) biodiversity data, is Dryad. This data repository is endorsed by

a wide range of journals and assigns a Digital Object Identifier (DOI) to a data package, which can be mentioned in the paper similar to accession numbers for sequences submitted to GenBank.

We hope that the practice of creating data papers, archiving and submitting (primary biodiversity) data associated with scientific papers will be widely adopted and foster scientific research and large scale modelling efforts supporting biodiversity conservation.

### Example data papers:

Jones et al. (2009). *PanTHERIA: a species-level database of life history, ecology, and geography of extant and recently extinct mammals*. (W. K. Mittermeier, Ed.) *Ecology, Ecological Archives E090-184*, 90(9), 2648–2648. *Ecological Society of America*. doi:10.1890/08-1494.1 <http://www.esajournals.org/doi/abs/10.1890/08-1494.1>

Brose et al. (2005). *Body sizes of consumers and their resources*. *Ecology* 86:2545. <http://www.esapubs.org/archive/ecol/E086/135/>

Penev, L., Mittermeier, D., Chavan, V., & Hagedorn, G. (2011). [http://www.pensoft.net/J\\_FILES/Pensoft\\_Data\\_Publishing\\_Policies\\_and\\_Guidelines.pdf](http://www.pensoft.net/J_FILES/Pensoft_Data_Publishing_Policies_and_Guidelines.pdf)

### Further reading:

- ➔ <http://www.pensoft.net/journals/>
- ➔ <http://www.datasets.com/journals/ecology/>
- ➔ <http://datadryad.org/partners>

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## BioFresh and GBIF

### Joining forces for the purposes of freshwater biodiversity

The efforts of BioFresh to mobilise freshwater biodiversity data and provide open and free access to them shows a lot of similarities to what the Global Biodiversity Information Facility (GBIF; [www.gbif.org](http://www.gbif.org)) and its participants are doing for biodiversity data in general. Given the scarcity of publicly available freshwater biodiversity data – despite the high decline in biodiversity that these environments face – we believe that there is definitely a need to raise specific attention on freshwaters like it is done for the marine environment too ([www.iobis.org](http://www.iobis.org)). But at the same time, we do not want to replicate any of the work by GBIF and are eager to join

forces with them. At this stage we have already adapted the GBIF Integrated Publishing Toolkit page to publish primary biodiversity data and are setting up a workflow to integrate data available through both the BioFresh and the GBIF network.

At the recent GBIF EU nodes meeting in Berlin, the initial steps to organise a joint mobilisation of data on freshwater invasive species together with BioFresh have been taken and we hope this will lead to a fruitful collaboration with several national nodes. At the same time, we are formalising our collaboration with the GBIF secretariat through the establishment of a Memorandum of



Cooperation to foster among others the exchange of data, the promotion of common standards and technologies and the development of joint activities.

➔ <http://data.freshwaterbiodiversity.eu/ipt>

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## BioFresh supported data acquisition

### Mobilising intercalibration datasets

One of the acquisition fund projects focuses on a very particular type of data: data from the intercalibration exercise for the Water Framework Directive. Rather than digitising and/or reformatting data to make them available through BioFresh, this project focuses on requesting permission to use these data.

These datasets, which were compiled to compare biological classification tools among EU member states, hold carefully selected taxonomic and environmental data from many European countries and thus form a valuable contribution to freshwater biodiversity data. The intercalibration took place for different Biological Quality Elements (BQE): phytoplankton, macrophytes, phytobenthos,

benthic fauna and fish, variously for lakes and rivers and was organised in different Geographical Intercalibration Groups (GIG) according to ecoregions. This led to a number of compiled datasets being created, containing data from several member states and even more original data providers. Needless to say, this results in a complex network of persons that need to be contacted or consulted for obtaining and releasing the data.

At this stage, we have obtained metadata details for 7 of the largest datasets which cover phytoplankton, macrophytes and invertebrates, representing surveys from nearly 3000 lakes. These datasets have already been circulated for internal use among the BioFresh partners.

After establishing a data provider agreement with all individual data holders, the data for which we obtained permission for public release will be integrated in the BioFresh data portal. There are 20 or so other GIG datasets either complete or under construction. Some contain only metric values (the calculated classification scores) whereas others contain raw species data and the amount of data is highly variable. Requests for access to these datasets are on-going as some of the intercalibration work only recently finished.

➔ <http://biofreshblog.com/2011/09/20/working-with-intercalibration-datasets/>

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## Freshwater fishes of Russia and adjacent countries

It is well understood at present that data on distribution of freshwater aquatic animals is a useful tool for underpinning global, European, and regional conservation planning efforts, particularly to identify outstanding and imperiled freshwater systems, for serving as a logical framework for large-scale conservation strategies, and for providing a global-scale knowledge base for increasing freshwater biogeographic literacy. The EU BioFresh project undertakes the essential first step in this endeavor of locating primary biodiversity data and making this basic data publicly available to the community.

We are very enthusiastic, being participants of BioFresh to be able to publish data on fish distribution in continental water bodies of European Russia and adjacent countries of the former USSR. Russia is currently not a member of GBIF, digitised catalogues of fish collections or other databases available online – and thus freely available

data are absent, and most data, if published, are dispersed among so-called “grey” literature that is not easily accessible.

The European part of the former USSR is a huge area drained by rivers of the White, Barents, Baltic, Black (with Sea of Azov) and Caspian Seas. Three of the largest European lakes – Lado-ga, Onega and Peipsi-Pihkva [Pskovsko-Chudskoye] – are located here. Though the fish fauna is species-rich in most regions of the area, only few local endemics exist in most drainages. In the south of the territory, the number of endemic fish species increases, especially in the Caucasian mountains and the Caspian basin. Experiencing taxonomic renaissance in the last couple of decades drastically changed our understanding of species assemblages in many river systems – many new species have been described and very many earlier synonyms re-established. In our database, we have at the moment 327 species and over 15,000 occurrence

records, and this is not the end. Whenever necessary with regard to present-day taxonomic concepts, we try to reconsider old or questionable taxonomic identifications of earlier authors, whose publications we use, based on our expert knowledge. As the publications are in Russian, the database content is being translated into English in order to make it useful for the community of the present-day users. For the database, we use the Artedien collection Management software ([http://artedi.nrm.se/fishbase\\_se/software/artedien/](http://artedi.nrm.se/fishbase_se/software/artedien/)) which is an excellent tool for the purposes of registering, cataloging, geo-referencing, and analysing data on aquatic animals distribution using the Darwin Core ideology.

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Caspian lamprey *Caspiomyzon wagneri*.  
Photo: Jörg Freyhof

## Distribution data of freshwater fishes of Poland

To build up a database of geo-referenced distribution data of freshwater fishes of Poland is the aim of our project. Almost the whole territory of Poland (area of 311,888 km<sup>2</sup>) belongs to the Baltic basin, and most is drained by two big European rivers – Odra (33.9%) and Vistula (54.0%). The fish fauna of Poland, especially riverine fishes, has been investigated using electrofishing since the late 1950s. As a result of these extensive studies, performed by several scientific teams, there are currently huge amounts of occurrence data, often even organised as time series. The precise locations of sampling sites, species composition, relative abundance, biomass as well as basic environmental parameters were collected and analysed but often published in local periodicals, books or expert reports. The form and style of presenting the most

basic information about a presence of a given fish species in a specific location were very heterogeneous and spread among ca. 400 papers, mostly in Polish language.

Our team collects these data from a huge set of diagrams, drafted maps, tables and descriptions, sometimes hidden deeply in papers. We also reconstruct places of sampling and assign geo-references to them. We know well from the field practice that most sites designed for ichthyological studies are located at road bridges. Thus, having even “not fantastically detailed description” of a sampling site position we are able to achieve quite a good approximation of geographical coordinates for many of them.

Altogether, we hope to collect over 5,000 sites which cover Poland almost completely.

Some rivers were investigated more in detail than others which gives the possibility to analyse temporal aspect of species occurrence and make our BioFresh database more attractive for scientists and nature conservation managers. Every record of the constructed database is linked with the literature source. This helps the user to find more detailed information of a site as well as names of original data collectors.

Our database will thus serve as a synthesis of ichthyofaunistic data of Poland, collected in professional way and published during the seven last decades.

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## Red List of North American fishes

Over the past 40 years, NatureServe has developed authoritative information about the conservation status of 45,000 species of North American plants and animals. Because the conservation status ranking system pioneered by NatureServe is different from the IUCN Red List, this wealth of information has not been compatible with Red List data.

As part of the Global Freshwater Biodiversity Assessment and with support from BioFresh, NatureServe is working with the IUCN and several fish Specialist Groups to convert NatureServe status assessments to IUCN Red List assessments for

800 species of North American freshwater fishes. The result will open up the moderately diverse and highly imperiled North American fish fauna to global analyses and comparisons with other parts of the world.

Aside from compiling the necessary supporting documentation for the IUCN Red List assessments, NatureServe has mapped both native and introduced fish species by fine scale watershed units. The dataset allows for analyses of areas with the greatest diversity as well as areas with concentrations of imperiled species where conservation action is urgently needed. The data can even be used in community analyses

to learn about the intactness of native freshwater fish communities. In the United States, the greatest diversity of fishes occurs in drainages of the Mississippi, Ohio, Tennessee and Alabama Rivers. About a third of North American species are threatened. The highest numbers of threatened fishes occur in drainages of the Wabash and Tennessee Rivers.

When data conversion is complete this year, an additional 800 species will be added to the IUCN Red List. This represents an expansion of 10% of the current number of bony fishes that have been assessed. The assessments will be searchable and accessible at the online Red



List website, at <http://www.iucnredlist.org>.

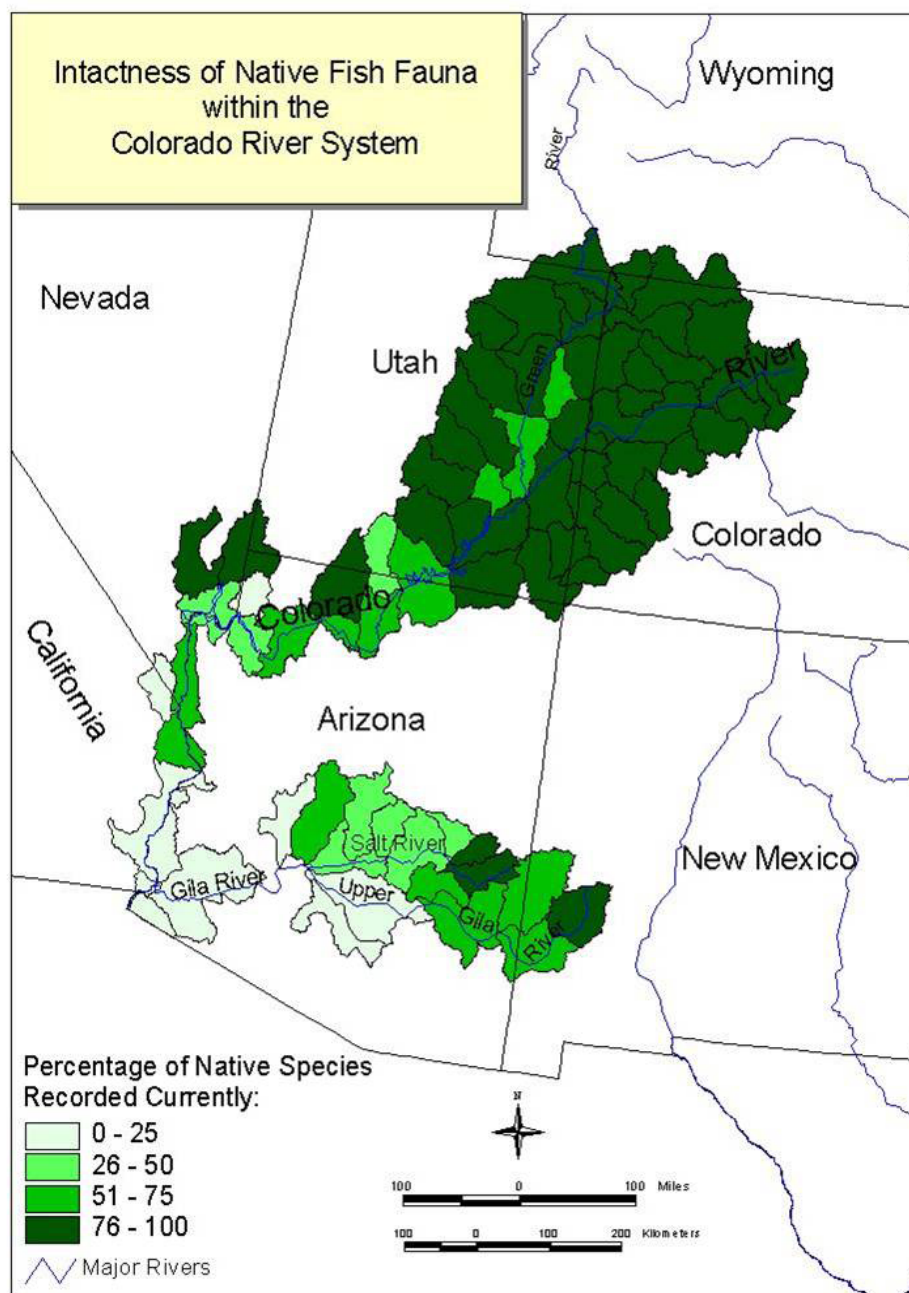
The distribution maps will appear together with the corresponding assessments. In addition, the maps will be available for download as a GIS

geodatabase so that conservation biologists can use them in their own conservation analyses. This major new dataset should help step up efforts to conserve an imperiled group of animals that not only performs important ecosystem services but also

provides great economic and recreational value.

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NatureServe



The intactness of freshwater fish communities declines with proximity to the mouth of the Colorado River System.  
Data source: NatureServe



## Global freshwater aquatic and wetland plant list

For decades as the level of interest in both freshwater plant conservation and their use as indicators of wetland health has increased, there has been uncertainty over which plants can be considered to be “aquatic”. Often people simply use the term “aquatic macrophytes” and claim to cover all water plants “large enough to be seen and identified with the naked eye”, but leave unclear which algae, lichens and bryophytes are considered to fit this definition, while some forget lower plants completely and only deal with vascular plants. Equally, there is ambiguity over the point on the bank of a water body at which plants cease to be considered aquatic. Over the last twenty years the author has been studying aquatic plants and this ambiguity has been a constant problem. Eventually

it became clear that there is no definition which will be applied consistently such that any two people are likely to recognise the same taxa as aquatic. It also became clear that the only way to resolve this problem would be to produce a list of plants that could be formally referred to as “aquatic”.

With funding from BioFresh, a list of recognised aquatic plants will be prepared during 2012 and the list will be converted by Bernard Dudley of CEH into a relational database. The aims of this project are:

- The database will have as core information for all wetland-dependent plant species (including vascular plants, bryophytes, algae and some lichens), the accepted name of each taxon, synonyms, the distribution

by country and IUCN status (where available).

- That members of the IUCN/SSC freshwater plant Specialist Group will be able to access and comment on entries, such as suggesting corrections to distribution data and even suggesting addition or removal of taxa from the list, however initially only the author will be able to edit entries.

In this way, the intention is to enable development of a globally recognised list of wetland-dependent plants that will serve as a basis for species, site and habitat conservation.

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*Baldellia ranunculoides* subsp. *ranunculoides*, Estremadura Province, Spain 2011.  
Photo: R.V. Lansdown

## MacroMED: Macroinvertebrate data from MEDiterranean climate rivers of the world

Following the BioFresh aim of improving collection and accessibility of freshwater biodiversity data, the MacroMED project recompiles and merges data of existent macroinvertebrate taxa from mediterranean rivers over the world (Mediterranean Basin, South Africa, Chile, California, and Australia). Biodiversity data will be requested to researches worldwide, and a database on the occurrence and abundance of macroinvertebrate data will be built, filled, and integrated into the BioFresh data portal to be accessible to all.

Mediterranean-climate regions are of special interest to BioFresh because they constitute top biodiversity hotspots of the world, despite occupying only 1.2% of land surface. Rivers in mediterranean regions host a high and endemic biodiversity, and are

thus a unique freshwater ecosystem. However, the knowledge regarding freshwater biodiversity patterns and processes remains scattered and incomplete. In the less developed countries located in North Africa and Chile, very few studies were made to inventory and map the existent taxa. In the south of Europe more studies have been developed, but in spite having a mass of freshwater researchers, many species remain undescribed because of the lack of taxonomists and funding for taxonomy. Moreover, a lot of information is found as grey literature (thesis, reports, etc.), which does not reach the broad audience.

This database will improve current knowledge regarding freshwater biodiversity of such impacted and humanised regions that will be especially useful in the context of the conservation and management

challenges raised by the ongoing global changes. The MacroMED database will allow (1) identifying the gaps of knowledge (e.g. areas that have been insufficiently or never prospected), (2) building future species distribution scenarios under forecasts of global change (i.e. climate change and species invasiveness), and (3) accurately evaluating the taxa responses to climate change (i.e. identifying biological thresholds, most sensitive species). Thus, it will be used in different BioFresh cross-cutting topics included in various project work packages.

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Medisouka, a mediterranean river in Morocco.

Photo: Núria Bonada



## Georeferenced database of freshwater fishes of the Western Balkans

Beginning in the late 1990s, biologists began to take an interest in the number and distribution of species that inhabited the world, and the fact that human alteration of the environment was probably eliminating many of them before they had even been described. In zoology, this has led to a new emphasis on traditional studies such as zoogeography and systematics and a renewed appreciation for the value of natural history collections and primary data on animal distribution.

Within our part of the BioFresh project, we aim to bring together the widely distributed data for freshwater fish occurrences of the countries of the Western Balkans (Slovenia, Croatia, Bosnia & Herzegovina, Montenegro, Macedonia). This area is extremely hydrologically and zoogeographically heterogeneous encompassing some Danube tributaries, a great number

of river drainages of the Adriatic basins from Isonzo [Soca] down to Drin, rivers of the Aegean basin in Macedonia, and amazing karst systems, surface and underground, and temporal springs and streams that are numerous there. Complex aquatic systems of karst harbour a rich but little-investigated biodiversity which still contains undescribed species.

The data on fish distributions in these regions is actually hidden in databases of national fisheries institutes, databases of regional fish collections as well as in grey literature. We are going to include historic databases which are held by SMNH (Slovenian Museum of Natural History) and NMW (Natural History Museum, Vienna) as well as others in case we are able to find an agreement that satisfies the collections' owners to provide open access to the data based on their deposits.

These databases and literature resources will be collected, and the records will be geo-referenced and organised into one database (using Artedian [http://artedi.nrm.se/fishbase\\_se/software/artedian/](http://artedi.nrm.se/fishbase_se/software/artedian/)) based on the Darwin Core schema. All necessary information will be translated into English and experts will update the database whenever necessary. We estimate that about 10,000 records will be databased and georeferenced. The resulting database will be relevant for conservation strategies of endemic karst organisms and karst ecosystems as a whole.

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A recently described species, *Telestes dabar* and its habitat Opacica River at Potkom, Dabarsko Polje (Bosnia and Herzegovina).

Photo: Aleksander Naseka



## Global freshwater shrimp database

Under the auspices of the BioFresh project, Oxford University Museum (OUMNH) is leading a 12 month project to assess the conservation status of the world's freshwater shrimp species. Freshwater shrimps (Caridea) are one of three radiations into freshwater of the decapod Crustacea, with an estimated 800 species (and subspecies) known to occur in a variety of freshwater habitats. Previously the freshwater crabs (1,280 species) and the crayfish (592 species) had already been assessed. After the completion of the shrimp assessments, the decapod crustaceans will be one of the first globally assessed higher level taxa in freshwater.

During the lifetime of the project, two regional workshops were held. The first, at the National University of Singapore in December 2011, had regional experts from Singapore, Taiwan, Australia, Indonesia and Austria. During the workshop, the majority of Indomalayan, Oceanian and Australasian (a near total of 500) species were assessed. Overall, 42% were

considered to be Data Deficient due to lack of habitat information. Of the remaining taxa, 58% were of Least Concern and 42% Threatened, with many of the karst cave dwelling taxa being Vulnerable. Interestingly, the highly coloured ancient lake species from Sulawesi, which are highly prized in the European and Asian aquarium trade were all considered to be Endangered, in part due to over harvesting.

A second workshop was held at UNAM, Mexico City with regional experts from Mexico and Brazil, the focus being on the Neotropical taxa, a total of 127 taxa. Overall, 22% of the neotropical fauna was considered Data Deficient, a lower percentage due to the larger body of work available on this fauna. Of the remaining taxa, 71.5% were of Least Concern (particularly comprising species distributed in the wider Amazon basin) and 28.4% Threatened, with again many of the karst cave dwelling taxa being Vulnerable, especially those in the Caribbean and Mexico.

As no regional experts are available on the African fauna (50 species), the data were compiled remotely at OUMNH. Of particular concern is the number of Threatened species in west Africa, due to pollution, primarily of the Niger delta.

Data compilation and assessment continues for the Nearctic (13 species) and Palearctic (60 species) fauna, but preliminary results show that the cave dwelling taxa are equally threatened.

The emerging pattern thus mirrors that of other freshwater taxa, with a significant proportion being threatened by pollution, human encroachment and other factors. In particular it mirrors the assessments for the other two decapod groups, crayfish and crabs, although due to the higher percentage of cave dwelling species, a significantly higher proportion is threatened.

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An undescribed species of *Paracaridina*, observed in an aquarium wholesaler during the Singapore workshop.  
Photo: Werner Klotz

## Geo-referenced database of Italian freshwater fishes

Italy is the home of a highly endemic fish fauna which belongs to the most threatened in Europe and maybe in the world. Italian fishes are very sensitive to alien fish species invasions and in no other area, have so many aliens been established and translocations happened as in Italy. During this BioFresh funded project we collect data concerning the distribution and (if available) the abundance of freshwater fish species in lakes, rivers and the whole Italian hydrographic system from natural and artificial water bodies.

A data request concerning all the monitoring or research

studies made on fish fauna was sent to about 330 local authorities and management entities of protected areas, and a cartographic database was built in MS Access 2007 to archive all the information collected.

During these months almost 30,000 records of species from fluvial reaches and lakes have been stored in the database. Data refer to:

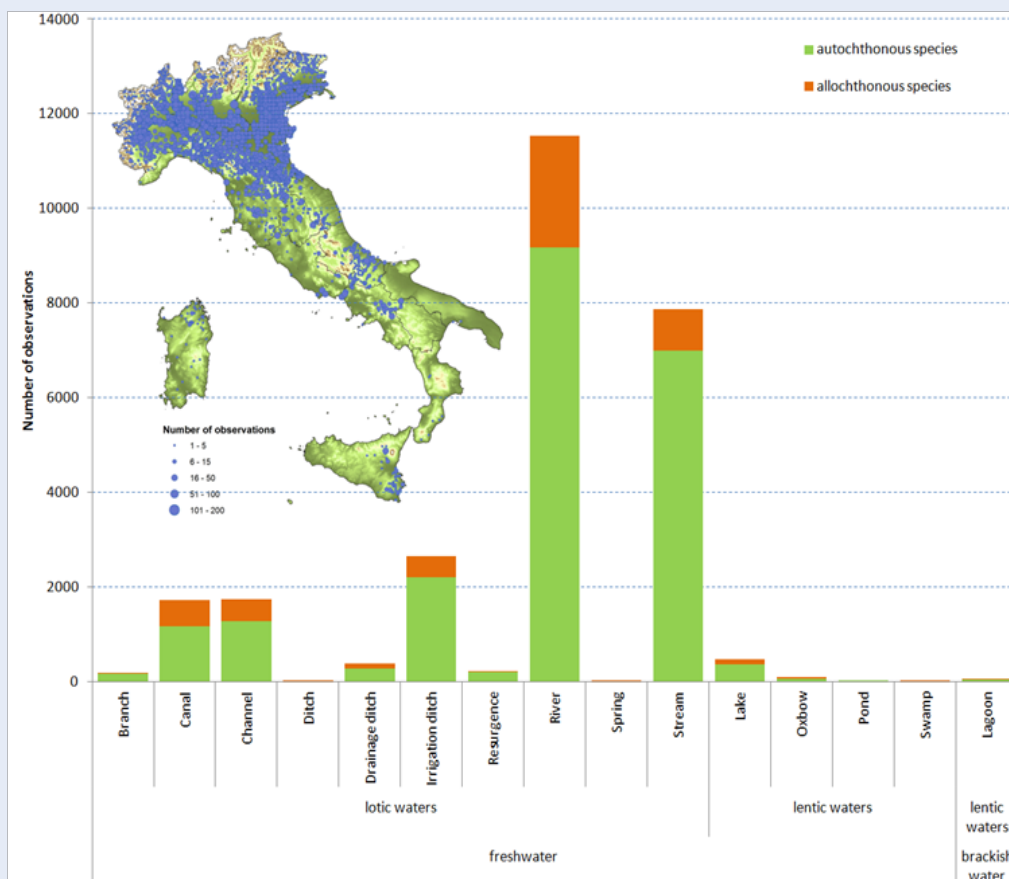
- observations from the last years of 19th century till now;
- almost 2,000 water bodies (about 100 lakes, ponds or lagoons and 1,900 rivers, streams, springs, canals or ditches);

- more than 100 species (65% autochthonous; 35% allochthonous). About 15 are marine species, found in brackish waters and in river estuaries

Still, most of the data recorded comes from the North of Italy, and from the largest river basins as for example the Po. In the next months the database will be expanded with a large amount of additional data, in order to complete the dataset for Italy as a whole.

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Cesare Puzzi  
GRAIA S.r.l.



Distribution map of Italian fishes collected so far.

Map: Cesare Puzzi

## The conservation status of New Zealand's freshwater biodiversity

Owing to its long isolation from the rest of Gondwana more than a 80 million years ago, New Zealand has developed a distinctive biodiversity of both animal and plant life. Comprising of two main landmasses – the North and South Islands – as well as numerous smaller islands, New Zealand has a total an area of approximately 268,000 km<sup>2</sup>. The country's varied topography combined with high annual rainfall gives rise to numerous freshwater habitats such as fast flowing rivers, coastal/brackish tidal lakes and dune lakes at low elevations, volcanic lakes in the North Island and high altitude glacial lakes in the South Island. Most of New Zealand's 3,800 lakes are young at less than 20,000 years old.

Between 18th – 29th July 2011, the IUCN SSC/Wetlands International Freshwater Fish Specialist Group held a workshop at Auckland Zoo to assess the conservation status of all New Zealand's 245 species of freshwater fishes, molluscs, odonata and aquatic plants. The workshop was attended by

16 experts from academic institutions, New Zealand's Department of Conservation, the National Institute of Water and Atmospheric Resources, research organisations and the National Museum.

Provisional results indicate that 23% of New Zealand's 245 freshwater species of the addressed groups are globally threatened according to the IUCN Red List of Threatened Species™, including 33% of the 160 endemic species. An alarming 48% of the 42 freshwater fish species have been assessed as threatened. The dragonflies and damselflies seem to be faring better, with 16 out of the 17 species occurring here assessed as Least Concern. Twenty-nine percent of New Zealand's 77 freshwater mollusc species are considered threatened, whilst 35% have been assessed as Data Deficient. Finally, of the 109 aquatic plant species, 82% were assessed as Least Concern and 11% are threatened.

Population reductions and range contractions of inherently rare species are of major concern.

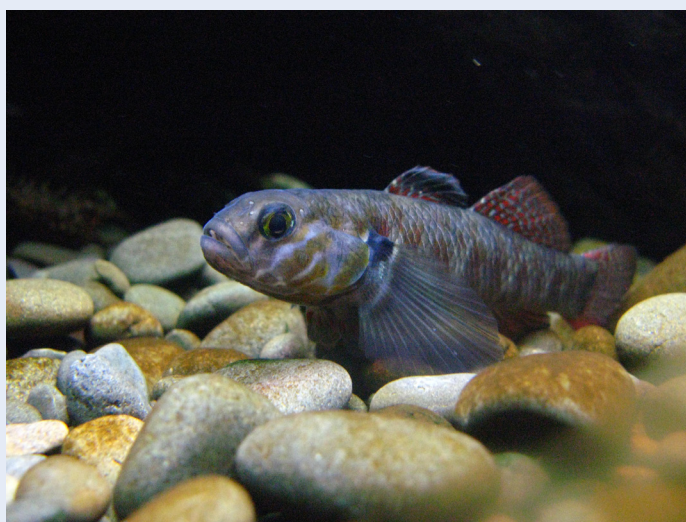
Habitat destruction and land used change has resulted in 85% to 90% of New Zealand's wetlands being lost in the last 100 years. Additional threatening processes include pollution of waterways, removal of riparian vegetation, loss or obstruction of fish passages, introduced, invasive species and overharvesting of whitebait.

Recommended conservation actions required included further protection of critical habitats, continued development and implementation of species recovery plans, on-going invasive fish eradication programmes and appropriate management of commercial whitebait and recreational sport fisheries.

All assessments will be published as part of the next update of the IUCN Red List of Threatened Species and a full report is being produced.

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New Zealand's endemic red-fin bully *Gobiomorphus huttoni*, which has been assessed as Near Threatened.

Photo: Claudine Gibson



## Data compilation on Central European riparian ground beetles



Typical riparian habitat along the river Mur in Southern Austria inhabited by an interesting ground beetle community. The embankment has been renaturated some years ago. This year collected data will be incorporated in the project.

Photo: Wolfgang Paill

In the last months we compiled taxa lists of riparian ground beetles (Carabidae) of riparian areas along Central European rivers from literature. Starting with best cited references from the Web of Science we learned, that a lot of these papers could not completely satisfy our claims. On the one hand many of these do not deal with full taxa lists and on the other hand they lack of abundance information and detailed environmental data or even do not inform about the sampling

points. In the next step we therefore concentrate on small papers in rather small journals of local or regional significance. Here we found a lot of rather interesting data, also including faunistic studies from important natural river systems in Northern France and Northern Italy.

In the next weeks we intend to continue with unpublished data from private databases, mostly collected in Austria and Germany by Wolfgang Paill, Michael-Andreas Fritze and

some colleagues. As we already noticed, these data will by far and away provide the best data sources. They are based on correct determinations and include information about abundance as well as exact geographical and environmental data.

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