# Fishbase Symposium 2012

## Fishes and dams

**Swedish museum of natural history**
15 October 2012

## Summary

FishBase

Naturhistoriska riksmuseet

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# Fishbase Symposium 2012 — Fishes and dams

## Introduction

The theme for FishBase Symposium 2012 was *Fishes and dams*. Thousands of dams are planned or being built in some of the species-richest rivers on the planet, in Africa, Asia and South America. Fish species in tropical rivers often have restricted distributions and/or migrate. What will happen when rivers get fragmented by dams? There is also an associated issue, which cannot be separated from the preservation of fish species: the issue of fisheries, and the food security of the people living by the rivers. In areas where dams are planned or being built, tens of millions of people rely on freshwater fish for their livelihood and to obtain protein. How will dams impact them?

FishBase invited six of the world's foremost experts on the effects of dams on biodiversity and fisheries to give talks on different aspects of the subject *Fishes and dams*. We were also fortunate enough to be able to show the new documentary film *Mekong*.

The symposium was held in Stockholm, Monday the 15th of October, in the Main Auditorium of the Swedish Museum of Natural History. The symposium attracted 199 registered participants.

*The 199 participants listened to the presentations by six of the world's foremost experts on fishes and dams, and saw the documentary film* Mekong.

**Michael Noren**, Curator of FishBase Sweden, welcomed everyone to “Fishes and dams” and introduced the moderator of the symposium, Professor **Christer Nilsson** of the Department of Ecology and Environmental Science, Umeå University. Dr Nilsson is a renowned expert on the subject of fishes and dams, and has published numerous scientific articles on how biodiversity is affected by dams.


*Moderator Christer Nilsson (right) and South African ichthyologist Paul Skelton (left)*

Catherine Reidy Liermann
University of Wisconsin-Madison, USA

Cathy Reidy Liermann is an ecohydrologist specializing in anthropogenic impacts on freshwater systems at multiple scales. Much of her research focuses on the impacts of dams at the global scale, including patterns of flow regulation and channel fragmentation by dams in relation to biogeography, socioeconomics and forecasts of global change. Additional work has involved environmental flow analyses, including development of a hydrogeomorphic classification of Washington State rivers for use in development of regional flow-ecology response curves. She currently works with Pete McIntyre at University of Wisconsin on the mapping and quantification of inland fishing worldwide, asking questions related to ecological sustainability and human dependency. Cathy's work is largely funded by international conservation NGOs that aim to balance human demand for freshwater services with sustainable biodiversity. After her PhD from Umea University in Sweden, Cathy completed a postdoctoral fellowship at University of Washington, Seattle – where she continues to live and work remotely for University of Wisconsin.

## A global overview of dams and freshwater biodiversity

Abstract: Dams obstruct rivers worldwide, impairing habitat and migration opportunities for many freshwater fish species. Fish extirpations and even extinctions have been directly linked to these and other dam impacts, forever altering freshwater biodiversity and related ecosystem services. This talk provides an overview of how and where dams pose the greatest threat to fish diversity, including specific taxa at risk. Affected ecosystem services will also be discussed in the context of an emerging study relating dams, fish diversity and inland fishing. These broad-scale analyses offer coarse filters for prioritization of freshwater conservation and restoration efforts worldwide.

Dr Liermann first gave an overview of dams over time, from an earthen dam constructed 2600 BC to the present day trends of building gigantic “mega-dams” and removing smaller dams to improve fisheries.

Different dams have different physical, chemical, and geomorphological effects on the hydrology of the river, such as interbasin water transfer, change in size and timing of variations in water level and flow, change in water temperature, and reduced flow due to water abstraction for agriculture. These effects lead to secondary changes in the biological productivity of the ecosystem, like blocking fish migration or reducing availability of plankton.

All in all, dams are the biggest threat to freshwater biodiversity when compared to 21 other threats such as eutrophication, overfishing or pesticides. Combining georeferenced maps of degree of regulation and maps of species richness allows the identification of ecoregions which should be prioritized for conservation or restoration.

In the second part of her talk she concentrated on freshwater fisheries as an ecosystem service. Globally, catches from freshwater fisheries are at least 10 million tonnes, and likely much higher. The majority of freshwater fish is captured in Asia, with countries such as Bangladesh and Cambodia getting more than half their animal protein from freshwater fish.

Using catch statistics and georeferenced maps of dams, it was possible to infer how dams changed river productivity, and evaluate future scenarios. Dams often, but not always, lead to improved fisheries in the reservoir, but lowered catches in other parts of the river. Diadromous (migrating) fish are especially sensitive to dams, and in some cases the losses of diadromous fish alone could outweigh the improved catches in dams.

Jörn Gessner
Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Biology and Ecology of Fishes, Berlin, Germany

Jörn Gessner wrote his Diploma thesis at Malaspina College at Vancouver Island, Canada and Hamburg University. Since 1996, he is a scientist for the Society to Save the Sturgeon at the Leibniz-Institute of Freshwater Ecology and Inland Fisheries, working as Project Leader for the German Sturgeon Remediation Project. Dr Gessner is currently involved in several projects aimed at investigating the ecology, population genetics and captive reproduction of sturgeons.

## Anthropogenic impacts on selected Asian sturgeon populations

Abstract: Sturgeons (Acipenseridae) are among the most highly threatened fish species worldwide. In 60 % of the species the conservation status according to IUCN deceased despite the fact that diverse rehabilitation activities are carried out. The long life-cycle resulting from old age at maturity (between 10 and 27years), the long intervals between reproductions (up to 8 years) and the complex life cycle with upstream migration for spawning, with distances in some species exceeding 2000 km, make sturgeon extremely vulnerable against anthropogenic impact. While in Central Europe sturgeon populations were among the first to respond to the impacts of the industrial revolution in the mid-18th century. The more rapid changes which act upon the large rivers of East Asia since the 1970s compressed the population response of the sturgeons even further. The Yangtze River serves as one of the case examples where high human population densities along the rivers, associated with the utilization of the rivers for navigation, waste water removal, overharvest and obstruction of migration routes have resulted in massively declining populations of all endemic sturgeon species. Countermeasures are currently carried out by ex situ measures and release programmes but no long-term perspective for rehabilitation of the species is envisaged due to increasing pressures on the water resources such as abstraction and hydropower development. In other river systems, such as the Amur and Tumnin rivers, endemic sturgeon species are dependent upon only one river system and as such need to be considered with extreme care when it comes to anthropogenic alterations along the rivers. Sturgeon can serve as umbrella species due to their complex life cycles and their susceptibility against pollution, as such indicating precarious environmental changes way ahead of other fish populations.


Dr Gessner started by giving a presentation of the 15 species of sturgeon living in eastern Asia. The different species occur under very different conditions, from arctic to subtropical, and differ in range from pan-Siberian to species restricted to a single river. All species migrate to breed, between the sea and river, or between different regions of the same river, and all have long generation times, reaching maturity in nine to 27 years, depending on species. Nearly all species have been impacted by dams, and most of them are now considered as endangered, critically endangered or functionally extinct.

He then used the Chinese sturgeon as a case study of the threats facing sturgeons. It is a large, late-maturing anadromous species which migrates 3000 kilometres from the sea up the Yangtze River, where it spawned in 21 known localities. The Chinese sturgeon until the 1980's supported a commercial fishery. After the completion of the Gezhouba dam in 1981, numbers dropped precipitously because the fish's spawning migration was mostly blocked by dams, with only two spawning grounds remaining accessible. The completion of the Three Gorges Dam in 2004 further reduced spawning success, due to changes in flow and reduced temperature of the water. The dam also acts as a sediment trap, so visibility at the spawning grounds has increased from 20 centimetres to 5 meters, resulting in increased predation on the sturgeon larvae. An attempt at captive spawning and release of Chinese sturgeons failed to restore the population. The species is limited by available spawning grounds; artificial spawning grounds could increase recruitment. Mitigation measures would be to improve access to spawning grounds through passage facilities and removing dams, adjusting the release of water to better suit the sturgeons, wastewater collection and purification, and reducing fisheries mortality by improved information and enforcement. Such measures are presently unlikely, so the Chinese sturgeon and several other species of sturgeon may in the short term need to be maintained *ex situ*.

Dr Gessner concluded by suggesting that sturgeons are good "umbrella" species for conservation: they are large, spectacular fishes which it is relatively easy to get the public to care about, and if rivers are maintained so sturgeons can survive, then most other species in the river will also survive.

Paul H. Skelton
South African Institute for Aquatic Biodiversity, Grahamstown, South Africa

Paul Skelton was born and grew up in Johannesburg, moving to Grahamstown to further his studies at Rhodes University. In 1972 he became Curator of freshwater fishes at Albany University, and in 1984 joined the JLB Smith Institute of Ichthyology as Curator of Freshwater Fishes. In 1995 Dr Skelton became the Managing Director of the JLB Smith Institute a position he held until his retirement in 2011. Later when the Institute became a National Facility of the National Research Foundation it was renamed SAIAB. Dr Skelton has published a large number of scientific articles on African freshwater fish and conservation in southern Africa, and is the author of several books, such as *A complete guide to the freshwater fishes of southern Africa*.

## The impact of dams on fishes in Africa

Abstract: Africa is a large, mostly dry continent. Rainfall is generally seasonal and drought is frequent in the savannah and semi-desert and desert regions. Dams are therefore an important component of development in many countries.
Topographically Africa may be divided into two divisions, High Africa and Low Africa, along a line extending from north of the Ethiopian Highlands in the North East, along the western side of the Great Rift and across the southern rim of the Congo Basin to the Angolan coast in the South-West. Fold mountain chains occur only in the extreme north-west (the Atlas Mountains) and south-west (Cape Fold Mountains) corners of the continent. The African fish fauna includes 76 families and around 2900 species. This fauna is richest in the tropics, more especially in the Congo Basin and adjacent systems of Low Africa. A recent IUCN conservation assessment indicated that 22% of fish species in Africa were threatened (Critically Endangered-4.1%; Endangered-5.2%; Vulnerable-12.5%) and a further 2.6% were Near Threatened. Most species were of Least Concern (57.4%) or Data Deficient (18%) and 0.1% were considered to be Extinct.
Africa has a large number of dams (135 large and at least 1075 secondary dams >500000 m3) with a high concentration in South Africa, Zimbabwe and Morocco, and to a lesser extent in West Africa, especially Burkina Faso. The purpose of the majority of the large dams is primarily hydroelectricity and irrigation, as well as water storage and supply. The impact of dams on fishes is especially serious in North Africa, the driest of the regions. The pathways by which dams impact on fishes are considered and may be either direct or indirect. Direct pathways include physical obstruction, ecological disruption and the impact of transfers through interbasin transfer systems (IBTs). Indirect pathways include anthropogenic actions

such as the introduction of alien fishes, the harvesting of fisheries stocks and the regulation of river flow through the release or retention of water.
A series of case histories illustrating the varied pathways and impacts of large, secondary and smaller dams on fishes in Africa are presented. The impacts of two well-known large dams, Aswan on the Nile and Kariba on the Zambezi are briefly summarized. Other cases consider headwater dams (the Lesotho Highlands Water Project), mid-basin dams and IBTs (Orange River Scheme and the Clanwilliam Olifants dams) and small dams and weirs in mountain catchments, and rivers of the Eastern Cape, South Africa. The varied impacts of these dams may be positive or negative on fishes, and, in some cases, have directly or indirectly determined the threatened conservation status of many species. Indirect pathways of impact, particularly the development of fisheries, including sport fisheries, has been a major outcome of dams impacting on fishes in Africa. The presentation concludes that the impact of dams on fishes in Africa has not been deeply assessed or studied, and a better consideration of the impact pathways suggests that the impact of dams on fishes is likely to be more extensive that generally appreciated.


Professor Skelton first gave a background to Africa and its fishes. Most of Africa is dry, with the highest fish diversity in the East African rift system and in a number of larger rivers such as the Congo. He then talked about the conservation status and various threats to African fishes, before moving on to dams in Africa. There are roughly 1200 dams in Africa, out of which 135 are large dams. The impact of dams on fishes can be divided into direct pathways (for instance barriers to migration, conversion of lotic conditions to lentic, and downstream flow change) and indirect pathways (for instance change in fishing pressure, alien species, and changes in hydrology).

He then used a series of case histories to highlight the various ways in which dams impact fish in Africa. First were the megadams Aswan and Kariba, which have profoundly affected fish fauna, but in different ways. Aswan has led to a number of species becoming extirpated or threatened. The loss of nutrients has depressed fisheries in the Mediterranean – an effect which however has reversed in recent time due to increasing release of untreated sewage

from Cairo. The Lake Kariba dam has led to the decline of previously common species, but also to an overall increase in fisheries due to introduced species like the Kapenta and Nile tilapia. These have also spread outside the dam, where they are threatening indigenous species by competition and hybridization. He then turned to the Lesotho Highlands Water Project, where transfer of water through tunnels had led to species spreading between drainages and endangering local populations. This theme repeated in the Orange River Scheme and Olifants River, where habitat loss, dams and invasive species were endangering the indigenous fishes. The numerous small dams and weirs in the Eastern Cape also had biological effects, in some cases even protecting local populations by hindering invasive species. He also told the story of the River pipefish, a marine species which has become endangered because dams are reducing the amount of freshwater and nutrients which reaches the estuaries where it breeds.

Professor Skelton concluded by noting that in Africa, being a dry continent, the impact of dams are different than in the temperate zone, and that when estimating the impact of dams one must also take indirect pathways such as the spread of invasive alien species into account.

Roberto E. Reis
Pontificia Universidade Católica do Rio Grande do Sul, Porto Alegre, Brazil

Roberto E. Reis is a Professor and Curator of Fishes at the Pontificia Universidade Católica do Rio Grande do Sul, and is an expert on South American catfishes. He is the regional chair for South America of the Freshwater Fish Specialist Group, Species Survival Commission, and advises the IUCN on conservation of threatened species. Dr Reis is the author of numerous scientific articles, four books, and has described over
80 new fish taxa.

## The effects of hydroelectric dams on the diversity of South American fishes

Abstract: This talk is an introduction to the effects that hydroelectric dams have on the diversity of South American fishes, especially the bad impacts dams have on their migration and reproduction. The talk begins with a short baseline information on Neotropical fish biodiversity and fish migration. Then proceeds to problems fish usually face during migration, ending up with hydroelectric dams as the largest problem of all. We will explore how dams affect fish biodiversity in different ways and end up the talk with the study case “damming the Amazon”.

Professor Reis started with an introduction to the fish biodiversity of the neotropics. Presently there are about 5400 species known, but the numbers are growing rapidly – on average a new fish species is described every 3.5 days, and there is no sign that the rate is slowing down! Neotropical habitats are extremely diverse with regards to flow, temperature, nutrients and water chemistry, and neotropical fish also show enormous diversity in size and ecology.

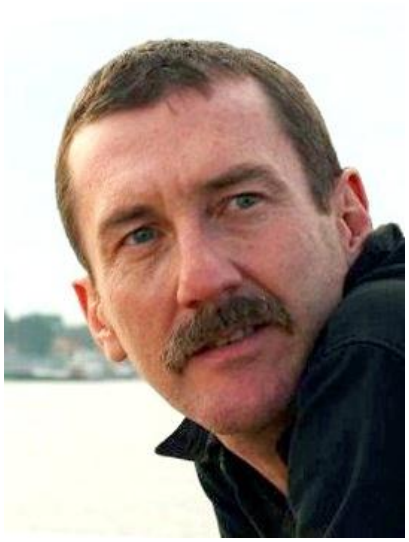
He then turned to the subject of migration. Migration is relatively long-distance seasonal movement of animals from one region to another. Season of the year, local availability of food, or mating are common triggers for migration. The reasons for migration are diverse, and include feeding, reproduction, temperature adjustment, avoiding adverse conditions. He detailed different types of migration, noting that in the Amazon potamodromous migration between different parts of the same freshwater system was common. Many fish migrate upstream to spawn, and the eggs and larvae drift downstream. Fish face many difficulties during migration. They must store energy for the journey, then they need to adjust to the differing temperature, light and water chemistry. During migration the fish are vulnerable to predation and fishing. Removal of riparian forest can remove sources of shelter and food, while water pollution can render the river unsuitable for the fish. The biggest obstacle to migration is dams, which interrupt migratory routes.

Next, Professor Reis talked about how dams affect fish diversity. Some species benefit from the dam and become abundant, while others are extirpated. Invasive alien species like African catfish were often cultured in the dams. Downstream daily water level fluctuations are a problem for both fish and fishermen.

There are different ways of helping fish pass dams, such as fish ladders, elevators, and channels, but these often are not adapted to neotropical conditions and do not work well. Two major problems were that even if fish get past the dam itself, they can no longer follow the current upstream to the spawning grounds, and even if they do, their eggs and larvae sink and die when flushed downstream into the reservoir.

Professor Reis concluded by talking about the large number of dams planned or under construction in the Amazon, and the effects these will have on neotropical fish biodiversity

Eric Baran
WorldFish Center, Phnom Penh, Cambodia



Eric Baran got his Ph.D. in biological oceanography from the University of Brittany and ORSTOM in France. He is now a Senior Scientist at the WorldFish Center.
Eric is specialized in tropical fish biology and ecology, small-scale fisheries and impact of dams. He is currently involved in several projects covering valuation of fisheries resources in Cambodia, optimized use of dam reservoirs and assessment of the potential effects of dams on freshwater fish diversity in the Mekong.

## Mekong fish: values, threats and options

Abstract: The presentation focuses on the exceptional richness of the Mekong fish resources and on the scenarios and options for their future. Fish biodiversity (second worldwide) and fish catch (world record) are presented in the first section, and regional food security implications are detailed. In the second part of the presentation threats to these resources are detailed, the main threat consisting in the rapid development of hydropower dams (16 dams in 2000, 88 dams planned in 2030). The impact of these dams on fish resources is analysed. Possible options for reduced impacts are reviewed in the last section, with a particular focus on better strategic planning of dam locations and on the fish passage facilities to be considered. Currently debated hydropower projects are also discussed in relation to the above perspectives.


Dr Baran started with a presentation of the Mekong River, from China to the sea. Mekong shows a great diversity of environments and with 781 species it is the second most species-rich river in the world, after the Amazon. The lake Tonle Sap in the Mekong drainage is the fourth most species rich lake in the world.

The high biodiversity supports the world's most intensive inland fishery. It is uncertain how big this fishery is, but based on consumption statistics it is estimated to 2 million tonnes per year. The countries along the Mekong have the highest consumption of freshwater fish in the world. At least 35% of the catch is migratory species which would be stopped by dams.

In 2000 there were 16 dams in the Mekong drainage, all on tributaries. By 2015 there will be 47 dams on tributaries, blocking 23% of the lower Mekong for migratory fish. By 2030 there will be 77 dams on tributaries, plus up to 11 on the mainstream Mekong, blocking up to 81% of the lower Mekong, resulting in an estimated reduction of fish catch of 600 000 tonnes. Another overlooked factor is the Mekong marine fisheries, which will also be affected by the dams as less nutrients will reach the sea.

Fish passes may help for at least some dams, but there are many problems. The pass must be designed with the biology of the fish in mind; it is difficult to attract the fish to the fish passes, different species react differently, and successive dams leads to compound losses even if the fish passes are well designed. Dr Baran used the proposed Laotian mainstream dam Xayaburi as a case study. Xayaburi will not greatly impact fisheries as it is in the upper Mekong, but will block migrating fish from a large area of tributaries. As many as 229 species will be impacted, and an estimated nine species will become endangered due to the dam.

Dr Baran then presented analyses which showed that dams on the tributaries are more damaging to fish yield than dams on the mainstream Mekong, with the planned Lower Sesan 2 dam being the worst: it alone will reduce fish biomass in the entire Mekong by 9%.

He concluded by pointing out the importance of recognizing that there is a trade-off between hydropower and food security in Laos and Cambodia.

Ian G. Baird
Department of Geography, University of Wisconsin-Madison, USA

Ian G. Baird is Assistant Professor at the Department of Geography at the University of Wisconsin-Madison, USA. He has been conducting research regarding the impacts of large hydropower dams in the Mekong River Basin for over 20 years, including for seven years in the 1990s while living in a remote fishing village on an island in the Mekong River in southern Laos. He has been monitoring fish and fisheries in the Sesan River Basin in northeastern Cambodia since 1995.

## Fishes and hydropower dams in the Sesan River (Mekong River basin): considering past impacts and future threats

Abstract: In 1993, the first large hydropower dam in the Sesan River Basin, the Yali Falls dam, began being constructed in the Central Highlands of Viet Nam, and by 1996 the dam was causing seriously negative downstream impacts in both Viet Nam and hundreds of kilometers downstream in northeastern Cambodia, including to fish and fisheries. The dam was finally completed in 2001, and since then has continued to cause negative but different downstream impacts. Various other large hydropower projects have since been developed in the Sesan River Basin in Viet Nam. None of the tens of thousands of mainly indigenous peoples impacted in Cambodia have ever received compensation. There are now plans for a large dam on the Sesan River in northeastern Cambodia, the Lower Sesan 2 dam. It threatens to cause especially serious negative impacts to fish and fisheries, including to highly migratory fish populations that move between the Sesan and Srepok Rivers and the mainstream Mekong River. This presentation reviews the past impacts of hydropower dams to fish and fisheries in the Sesan River basin, and prospects for future impacts if the Lower Sesan 2 dam is built. My main argument is that it is crucial to be more aware of the potential negative impacts of large tributary dams in the Mekong River Basin, especially in relation to fish and fisheries.


Dr Baird's presentation centred on a case study of the dams in the Sesan River basin, Viet Nam. The basin stretches from the central highlands of Viet Nam to north-eastern Cambodia. It has high fish diversity with over 300 recorded species, most of which migrate between the Sesan basin and the Mekong. The local populations are heavily dependent on fish from the basin. In 1993 construction of the first large hydropower dam in the Sesan River basin, the Yali Falls dam in Viet Nam, began. The environmental impact assessment only considered impacts 6 km downstream of the dam, and only in Viet Nam, but the dam is causing seriously negative impacts hundreds of kilometres downstream, in both Viet Nam and Cambodia. In Cambodia the dam has impacted 55000 people in 90 villages. Surges of water have washed away boats, fishing gear, crops, wildlife and people (39 human deaths). Water quality has deteriorated, with people and animals getting sick and dying. River bank erosion has increased dramatically, a phenomenon called “hungry water”. Downstream fisheries have declined sharply, due to changes in water quality caused by blooms of toxic algae, changes in hydrological conditions, increased sedimentation in deep water pools, disrupted migratory routes, and degraded breeding grounds. None of the tens of thousands of mainly indigenous people impacted in Cambodia have received compensation.

Several other large hydropower projects are under construction or are planned in the Sesan river basin. There are now plans for a large dam on the Sesan River in north-eastern Cambodia, the Lower Sesan 2 dam. The dam will directly or indirectly impact hundreds of thousands of people in Cambodia, Laos, Thailand and Viet Nam. The dam threatens to have especially serious negative impacts on fish and fisheries by blocking fish populations which migrate between the Sesan and Srepok Rivers and the mainstream Mekong River, reducing fish yield from the lower Mekong and Tonle Sap, and upriver in Laos and Thailand. Only villagers in the inundation area will receive any compensation. Local communities are strongly negative about the dam and have carried out peaceful protests, but since the area is remote and the population mostly ethnic minorities, they have little influence. Dr Baird stressed the crucial importance of increased awareness of the potential negative impacts of large tributary dams in the Mekong River Basin, especially in relation to fish and fisheries, and the need to revamp the Mekong agreement to consider tributary dams.

## Douglas J. Varchol

Douglas J Varchol is a Bangkok-based director, producer and writer in film and television, with more than fifteen years of professional experience. He has created science, history and cultural programming for, among others, The Learning Channel, The History Channel, and PBS in the U.S. and Discovery Channel Europe and BBC World News in the U.K. Mr. Varchol has directed, produced and filmed in many countries, including Sudan, Kenya, Tanzania, Nepal, India, Ladakh, Vietnam, Thailand, Sri Lanka, Maldives, Philippines, Borneo, China, Cambodia, Indonesia, Lao PDR, and Australia. In the past four years has made six half-hour Earth Report documentaries for BBC World News, including "Perfectly Cool," about the Chinese air conditioning industry's approach to phasing out ozone depleting gases; and "Heads Above Water" which looks at how coastal towns in Java and the Mekong delta are adjusting to sea level rise. His Earth Report, "Gambling On Laos," examined biodiversity issues in northern Laos. He has just completed directing "Mekong", an hour-long documentary about hydro power development on the Mekong River in southeast Asia.

### *Mekong*

Abstract: *Mekong* is a one-hour documentary on the Mekong River, examining the issues of hydropower development and its impact on Mekong citizen's lives. The film features stories of Mekong Citizen's up and down the river, from fishers on the Tonle Sap, activists still fighting at the Pak Mun dam in Thailand, to a vice minister from Laos convinced he can build one of Southeast Asia's most sustainable dams. Filmed in four countries, and four languages, it includes footage of China's Mekong [Lancang] dams, as well as on-site footage of the controversial Xayaburi dam in Laos.
This independent film was produced and directed by Douglas Varchol and funded by CGIAR Challenge Program for Water and Food, IUCN and Sida.

Douglas Varchol gave a brief introduction to his one-hour documentary film *Mekong*. The film, he explained, was not intended to convince people to oppose or support dams, but was intended to promote discussion about hydropower in the countries of the Mekong basin. The film showed the pros and cons of hydropower development in the Mekong, by focusing not on technology or statistics, but on the people living by the river.

## Additional resources for fishes and dams

**FishBase** is the world's largest encyclopaedia of fish, covering all species of the world, with references and links: http://www.fishbase.org

**International Union for Conservation of Nature (IUCN)** is dedicated to the global preservation of biodiversity. IUCN maintains the Red Data List of threatened species, such as the Chinese sturgeon: http://www.iucnredlist.org/details/236/0

IUCN also publishes reports on the conservation status of different regions: http://www.iucn.org/about/work/programmes/species/our_work/about_freshwater/

**International Rivers** specializes in the protection of rivers and lakes, and the communities living by them: http://www.internationalrivers.org/

**World Wildlife Fund (WWF)** is one of the world's largest environmental protection organizations. Its Dams initiative focuses on the effects of dams: http://wwf.panda.org/what_we_do/footprint/water/dams_initiative/

# Participant list FishBase Symposium 2012

### *Speakers:*

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| Ian Baird | University of Wisconsin-Madison, USA |
| Eric Baran | World Fish Center, Cambodia |
| Roberto E. Reis | Pontifícia Universidade do Rio Grande do Sul, Brazil |
| Jörn Gessner | Leibniz Institute of Freshwater Ecology and Inland Fisheries, Germany |
| Cathy Reidy Liermann | University of Wisconsin-Madison, USA |
| Paul Skelton | South African Institute for Aquatic Biodiversity |
| Douglas Varchol | film producer, Thailand |

### *Moderator:*

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| Clarice Alho | PUCRS, Brazil |
| Mirjam Amcoff | Uppsala universitet |
| Klas Andersson | Excelsior BioConsulting |
| Sten Andersson | Fiskerikonsulent |
| Helena André | Miljödepartementet |
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| Gunnar Anéer | |
| Aster Asgedom | Länsstyrelsen Västra Götaland |
| Ingrid Asker | Naturhistoriska riksmuseet |
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| Kristian Benkö | Aquaria vattenmuseum |
| Mariana Bergkvist | |
| Eva Bergman | Karlstads universitet |

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| Jimmy Blom | Länsstyrelsen Sörmland |
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| Daniel Brelin | Länsstyrelsen Uppsala |
| Ellen Bruno | Naturskyddsföreningen |
| Olle Calles | Karlstads universitet |
| Tomas Carlberg | SLU |
| Martin Dahl | Stockholms universitet |
| Staffan Danielsson | Europaparlamentet |
| Bo Delling | Naturhistoriska riksmuseet |
| Bernd Dinse | Haninge akvarieförening |
| Stina Drakare | SLU |
| Björn Edman | Rheoconsult |
| Niklas Egriell | HaV |
| Axel Emanuelsson | Norconsult |
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| Suzanne Faxneld | Naturhistoriska riksmuseet |
| Amanda Borgqvist Fenyi | Marina Läroverket |
| Bo Fernholm | Naturhistoriska riksmuseet |
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| Charlotte Flodin | |
| Göran Flodin | |
| Jenny Fors | WWF |
| Maja Forslind | SIDA |
| Anna Forslund | WWF |
| Martin Franzén | Akvarievärlden uthyrning |
| Christina Franzén Bengtson | Naturhistoriska riksmuseet |
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| Gun Frostling | författare |
| Gloria L. Gallardo Fernández | Uppsala universitet |
| Thomas Giegold | Stockholms universitet |
| Sofie Gisslén Telning | Stockholms universitet |
| Anders Göthberg | |
| Emily Gripenstam | Akvarievärlden uthyrning |
| Stina Gustafsson | Karlstads universitet |
| Anna Hagelin | Karlstads universitet |
| Anders Hargeby | Linköpings universitet |
| Nils Hedberg | Stockholms universitet |
| Micaela Hellström | Stockholms universitet |
| Axel Henckel | Sportfiskarna |
| Andrea Hennyey | Stockholms universitet |
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| Staffan Hermansson | Naturskyddsföreningen |
| Mikael Himberg | Åbo akademi |
| Thorbjörn Hongslo | SVA |

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| Jan Isakson | Greenpeace |
| Sven Jakobssson | Stockholms universitet |
| Charlotta Järnmark | WWF |
| Torbjörn Järvi | |
| Linda Johanson | Södertörns högskola |
| Göran Johansson | fotograf |
| Ulf Johansson | Naturhistoriska riksmuseet |
| Stefan Johansson | Exclusive Baits |
| Richard Johnson | SLU Aqua |
| Bodil Kajrup | Naturhistoriska riksmuseet |
| Linda Kaneryd | Energimyndigheten |
| Jan Karlsson | J-K Miljökonsult |
| Magnus Karlsson | African Diving Ltd |
| Mikael Karlsson | African Diving Ltd |
| Ingemar Karlsson | |
| Therese Kihlberg | Marina Läroverket |
| Jan Kuberski | Naturhistoriska riksmuseet |
| Sven O Kullander | Naturhistoriska riksmuseet |
| Carin von Köhler | Stockholms universitet |
| Tiina Laantee | Huddinge kommun |
| Vendela Kempe Lagerholm | Naturhistoriska riksmuseet |
| Bengt Larsson | Bela vattenbrukskonsult |
| Josefine Larsson | Södertörns högskola |
| Matias Ledesma | student |
| Johan Lind | Norconsult |
| Emma Lind | Södertörns högskola |
| Ingrid Pascual Lindemark | |
| Anna Ljungberg | SIDA |
| Bo Ljungberg | Södertälje kommun |
| Stefan Lundberg | Naturhistoriska riksmuseet |
| Tyrone Lundström | Stjerberg trading |
| David Lundvall | Länsstyrelsen Dalarna |
| Ruairi MacNamara | National University of Ireland Galway |
| Mia Magnusson | Skövde kommun |
| Emil Maier | Haninge akvarieförening |
| David Mårding | Aquaria vattenmuseum |
| Ralph Mårtensson | |
| Margareta Mårtensson | |
| Tanja Martins | Sötvattenslaboratoriet |
| Daniel Melin | Länsstyrelsen Uppsala |
| Bo Meuller | |
| Daniel Molin | |
| Aman Mottaqui-Tabar | student |
| Sture Nellbring | Länsstyrelsen Stockholm |
| Oscar Nordahl | Linnéuniversitetet |
| Lars Norelius | Bolandgymnasiet |

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|---|---|
| Michael Norén | Naturhistoriska riksmuseet |
| Johnny Norrgård | Karlstads universitet |
| Marie Norstedt | Marina Läroverket |
| Lennart Nyman | Man & Water AB |
| Daniel Nyqvist | Karlstads universitet |
| Lars-Olof Omfors | Stockholmsakvaristerna |
| Kenneth Ottosson | Hushållningssällskapet |
| Stefan Palm | Sötvattenslaboratoriet |
| Tove Porseryd | Södertörns högskola |
| Jannikke Räikkönen | Naturhistoriska riksmuseet |
| Mattias Renström | Stockholms universitet |
| Nasim Reyhanian | Södertörns högskola |
| Risa Rosenberg | WWF |
| Tommy Rosendahl | SLU |
| Peter Rudberg | SEI |
| Bernt Rydgren | ÅF |
| Klara Sahlin | |
| Mikael Sakrisson | Naturhistoriska riksmuseet |
| Leonard Sandin | SLU |
| Alfred Sandström | Sötvattenslaboratoriet |
| Susanna Schröder | Naturvårdsverket |
| Erik Sjölander | Fisk och Vattenvård AB |
| Helena Söderberg | |
| Anders Stark | Livsmedelsverket |
| Barbro Stark | Livsmedelsverket |
| Thomas Strid | Huddinge kommun |
| Annika Strömberg | Naturhistoriska riksmuseet |
| Josefin Sundin | Uppsala Universitet |
| Amalia Sundman | Marina Läroverket |
| Linda Svensson | Sportfiskarna |
| Björn Tengelin | Structor |
| Els Thieren | Museum of Natural Sciences, Brussels |
| Fabian Torell | Marina Läroverket |
| Robban Tranefalk | Aquaria vattenmuseum |
| Masahito Tsuboi | Uppsala Universitet |
| Didrik Vanhoenacker | Naturhistoriska riksmuseet |
| Richard Vestin | Huddinge kommun |
| Elina Viinamäki | |
| Tomas Viktor | IVL |
| Lennart Wahlqvist | |
| Anna Weise | Naturhistoriska riksmuseet |
| Niklas Wennberg | Hyla Pond AB/Stadsjord |
| Anna Wennberg | Stockholms universitet |
| Lovisa Wennerström | Stockholms universitet |
| Håkan Westerberg | Sötvattenslaboratoriet |
| Håkan Wickström | Sötvattenslaboratoriet |
| Ulf Wiel-Berggren | |

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| Charlie Wijnbladh | Naturskyddsföreningen |
| Anders Wilander | SLU |
| Eva Willen | SLU |
| Kjell Winström | Vattenfall |
| Johanna Wouters | Södertörns högskola |
| Ola Åhlander | |
| Erik Åhlander | Naturhistoriska riksmuseet |
| Linda Åkerblom | Södertörns högskola |
| Jill Staveley Öhlund | Naturhistoriska riksmuseet |
| Johan Östergren | Sötvattenslaboratoriet |

# FishBase Symposium 2012 — Fishes and Dams

*Stora Hörsalen*, Swedish Museum of Natural History, Frescativägen 40, Stockholm.

## Programme

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| 09:00 - 09:30 | Registration, coffee and sandwiches |
| | Moderator: **Christer Nilsson,** Umeå University. |
| 09:30 - 09:35 | Opening, **Michael Norén**, FishBase Sweden. |
| 09:35 - 10:20 | **Catherine Reidy Liermann**, University of Wisconsin*: A global overview of dams and freshwater biodiversity.* |
| 10:20 – 11:05 | **Jörn Gessner**, Leibniz-Institute of Freshwater Ecology and Inland Fisheries*: Anthropogenic impacts on selected Asian sturgeon populations.* |
| 11:05 – 11:30 | Fruit break |
| 11:30 – 12:15 | **Paul Skelton**, South-African Institute for Aquatic Biodiversity*: The impact of dams on fishes in Africa* |
| 12:15 – 13:00 | **Roberto E. Reis**, Pontifícia Universidade Católica do Rio Grande do Sul: *The effects of hydroelectric dams on the diversity of South American fishes.* |
| 13:00 – 14:00 | Lunch break |
| 14:00 – 14:45 | **Eric Baran,** World Fish Center: *Mekong fish: values, threats and options.* |
| 14:45 – 15:30 | **Ian Baird**, University of Wisconsin-Madison: *Fishes and hydropower dams in the Sesan River (Mekong River basin): considering past impacts and future threats.* |
| 15:30 – 16:00 | Coffee break |
| 16:00 – 17:10 | Film screening: *Mekong – River on the edge.* New documentary presented by **Douglas Varchol** and SIDA |
| 17:10 – 17:15 | Symposium Close |