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Plenary Speaker: Fish Passage in an Era of Broken Rivers: New Approaches a Reason for Hope?

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Fish passage in an era of broken rivers: new approaches a reason for hope?

In an era of decline of large-bodied, migratory fishes, river connectivity has been shown to be increasingly important for the conservation of native biodiversity. From North America to Asia, Europe to South America, issues with river connectivity influence – for better or worse - the life cycle, and population status, of migratory fishes. In the Mekong River Basin, the world's largest fishes, including the Critically Endangered Mekong giant catfish *Pangasianodon gigas* and giant pangasius *Pangasius sanitwongsei*, face extinction because of mainstream dams on the lower Mekong. In China, populations of the Chinese sturgeon, *Acipenser sinensis*, and Chinese paddlefish, *Psephurus gladius*, have declined significantly since the construction of the Gezhouba and Three Gorges Dams. In North America, connectivity is increasingly recognized as a determining factor in the health of sturgeon and salmon populations in the Columbia and Fraser Rivers; similarly, American paddlefish, *Polyodon spathula*, and pallid sturgeon, *Scaphirhynchus albus*, are impacted by dams and habitat fragmentation. The situation is similar in New Zealand, where a combination of factors – from dams to habitat degradation to overfishing – is resulting in unprecedented population decline of species like the longfin eel *Anguilla dieffenbachii*. Identifying novel fish passage solutions that maximize environmental benefit and minimize cost is the only way to provide for needs of a rapidly growing human population while also protecting imperiled aquatic fauna. Fish passage broadly interpreted includes a wide range of solutions to increase connectivity and restore fish migrations and populations. New methods of study, technologies, decisions about dam placement and dam removal all offer potential for restoring threatened fish. On a policy level, the Convention on Migratory Species provides a framework for management of transboundary migratory freshwater fish – a neglected biota in urgent need of study and protection.

Dr. Zeb Hogan is an assistant research professor at the University of Nevada-Reno, the United Nations Convention on Migratory Species Councilor for Fish, and a National Geographic Society Fellow. Zeb also hosts the National Geographic Television series “Monster Fish”. Zeb received his Ph.D. in Ecology from the University of California, Davis in 2004. His research interests include freshwater fish ecology, fisheries management, and endangered species issues. Since 2006, Zeb has worked with the University of Nevada and the National Geographic Society to merge conservation science with education and action. Project outputs to date have included contributions to understanding the migratory patterns and population structures of focal fish species, designation of the Mekong giant catfish and other species as Critically Endangered on the IUCN Red List, and awareness-raising through international and local media. Zeb's recent articles include “Engaging Recreational Fishers in Management and Conservation: Global Case Studies”, “Endangered River Fish: Factors Hindering Conservation and Restoration”, and “Size-biased extinction risk of the world's freshwater and marine fishes”. Zeb's research has also been featured in *Science* (2007), *Bioscience* (2005), and *American Scientist* (2004). A web series on Zeb's research won the Science Journalism Award (online category) from the American Association of the Advancement of Science (AAAS) in 2008.