



Listen to the River

Lessons from a global review of environmental flow success stories

Andrew Harwood¹, Susan Johnson¹, Brian Richter², Allan Locke³, Xuezhong Yu¹, and David Tickner⁴



Introduction

Environmental flows (e-flows) defined (Brisbane Declaration):

"The quantity, timing, and quality of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on these ecosystems."

Issue-

Pressures on worldwide freshwater supplies are increasing due to rising population and the needs of agriculture, industry, and cities. As a result many countries have recognized the integral part that e-flows should play in water management and policy.

Efforts to implement e-flows have faced significant challenges but many success stories have also emerged.

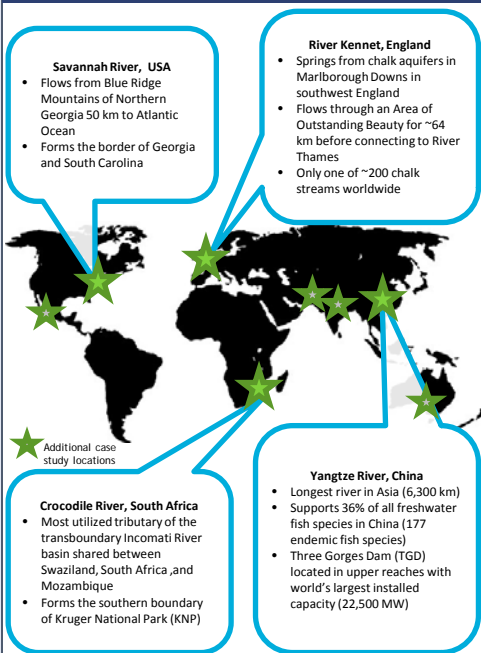
Objective-

To showcase global success stories of e-flow implementation for benefits to society and ecosystems.

Method-

We interviewed a variety of stakeholders involved in e-flow implementation in rivers from a range of geographical, cultural, economic and hydrological contexts to arrive at case study success stories and recommended actions.

Case Study Rivers



Case Studies of E-flow Success

Savannah River, USA, Sustainable Rivers Program

The Issue-

A series of droughts in the late 1990s and early 2000s highlighted the issue of water as a finite resource. Impacts to water quality (low dissolved oxygen in the harbour), fish species (e.g., endangered sturgeon), recreation, and property values focused the attention of various stakeholder groups.

The Response-

The US Army Corp of Engineers (USACE) and the Nature Conservancy (TNC) began a national collaboration, the Sustainable Rivers Program, in 2002 to improve water management in rivers across the USA by implementing e-flows through adaptive reservoir operations. State, federal and local agencies, academic institutions and NGO representatives collaborated to make initial e-flow recommendations for spring flood pulses. E-flow implementation began in 2004 and has been adaptively managed since with updates based on monitoring, research, and learning.



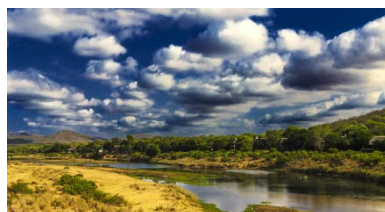
Crocodile River, South Africa

The Issue-

The river flows through a diverse landscape and the catchment is water-stressed from existing and anticipated future demands, causing concerns over meeting needs for irrigation, municipalities, and the KNP, along with transboundary water-sharing commitments.

The Response-

E-flows successfully implemented by establishing the Inkomati-Usuthu Catchment Management Agency (IUCMA) through the National Water Act of 1998. The IUCMA engaged local stakeholders through the establishment of an Operations Committee to develop e-flows that balance multiple needs, and is using real-time decision support tools and strategic adaptive management to better manage available water.



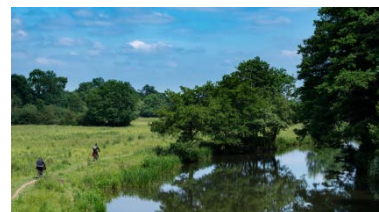
River Kennet, England

The Issue-

Groundwater abstracted from the chalk aquifer beneath the river is used to supply water locally and to another catchment (south Swindon). Treated wastewater is released to another catchment and is therefore lost to the river basin. Under drought conditions, groundwater abstraction reduces surface flows by up to 35%.

The Response-

Studies conducted by the Environment Agency (EA) and Thames Water provided evidence that groundwater abstraction was the cause of reduced flows. The EA and Thames Water worked together to solve the public water supply issue by proposing an alternate water supply to south Swindon when a low flow threshold on the Kennet River is reached. WWF and a local NGO (Action for the River Kennet) championed the necessary legislative change that allowed Thames Water to fund the alternate water supply project.



Yangtze River, China, Three Gorges Dam

The Issue-

30 dams have been constructed on the upper reaches of the Yangtze River and its tributaries affecting the natural flow and thermal regime downstream of the TGD. The flow and temperature requirements for 4 species of Chinese carp have been impacted, affecting reproduction and resulting in dramatic decreases in annual commercial fish harvest.

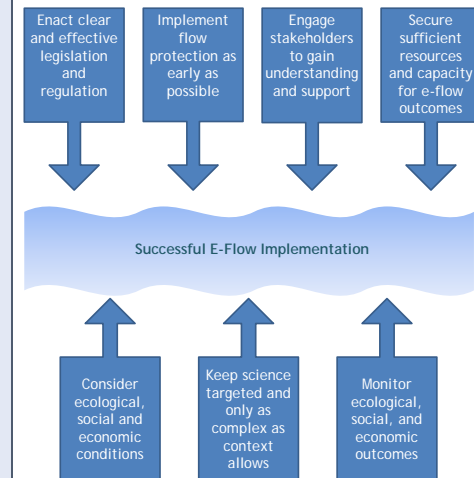
The Response-

Collaboration occurred between resource agencies (Ministry of Agriculture, Ministry of Water Resources, WWF-China) and the hydropower operator to implement e-flows at the TGD to mimic the Yangtze River's natural flood pulse and promote carp spawning.



Recommended Actions for E-Flow Implementation

- There are a number of ways to successfully implement e-flows: there is no one-size-fits-all approach. Implementation is dependent on system and jurisdiction concerns and the legal, political, institutional, social, economic, and ecological contexts.
- Common truths from case study review for recommended actions to successfully implement e-flows include:



Additional Information

To learn more and view the full report visit:

<https://www.wwf.org.uk/what-we-do/projects/environmental-flows>

★ Additional case studies include: Murray-Darling Basin, Australia, San Pedro Mezquital River, Mexico, Poonch River, Pakistan, and Ganga River, India

View related policy brief, Critical Factors for Water Policy to Enable Effective Environmental Flow Implementation, Front. Environ. Sci., 30 May 2018 at: <https://doi.org/10.3389/fevs.2018.00037>

Author information:

¹Ecofish Research Ltd., Cranbrook, Vancouver, BC, Calgary AB, Canada

²Sustainable Waters, Crozet, VA, USA

³Locke and Associates, Kaslo, BC, Canada

⁴World Wildlife Fund, Woking, UK

For additional information please contact:
Andrew Harwood, Ph.D, R.P.Bio.
Ecofish Research Ltd., Cranbrook, BC, Canada
Phone: 778-879-8814
aharwood@ecofishresearch.com
<http://www.ecofishresearch.com/>

