

Why Our Rivers Need a Citizen Science Movement

Decisions about managing our rivers are often based on incomplete information – creating a picture whose gaping holes that are likely to remain unfilled by the time construction of a dam or diversion begins. When there is no provision for professional scientists to fill these gaps in our knowledge, citizen science – scientific research conducted by amateurs – can step in to help uncover critical information about a river’s health, and make use of their findings for river protection.

TOO MUCH WORK, TOO FEW SCIENTISTS

Volunteers in the US state of Oregon are helping scientists at the Dept. of Fish and Wildlife survey 146 miles of streams. They are locating and counting salmon and native trout species and helping restore habitat.

Hundreds of volunteers with The Nature Conservancy annually survey how much desert land is made wet by the San Pedro River; they cover more than 250 miles. The information is used by federal land managers, academic researchers, and private landowners in the US and Mexico.

The US’s biggest dam removal, now underway on the Elwha River in Washington state, will restore 113 km of wild river, and is creating a host of opportunities to study the ecosystem before and after removal. Citizen scientists are joining professional scientists to archive the current mix of species in the Elwha before the dams are removed. The work will provide evidence to evaluate the success or failure of dam removal on species’ rehabilitation.



WHAT WE DON'T KNOW CAN HURT US

Large dams can destroy riverine ecosystems, yet dam projects rarely include funding for adequate “baseline” surveys to show what is at stake, or money for post-construction research to document changes to the river.

Citizen science can be used to document basic information about a river system, as well as changes over time to its flow, sediment load, species and water quality.

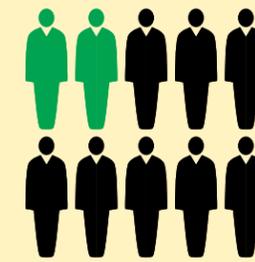
China’s proposed South-North Water Transfer Project would have massive impacts on many key waterways, yet there are huge gaps in knowledge. Scientist Yang Yong recruited volunteers for a four-year assessment of 10,000km of China’s western rivers. The information they gathered is being shared with citizens’ groups and government agencies to inform land and water use decisions.



BECAUSE OUR RIVERS ARE IN PERIL



Just **1 in 10** rivers now reach the sea



8/10 people depend on river resources

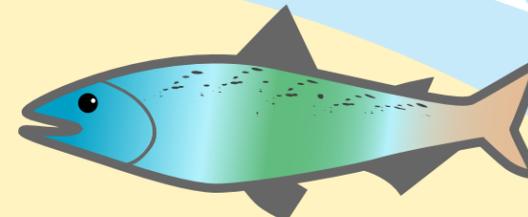


2/3 of Earth’s major rivers are dammed

UNCOVERING RIVER MYSTERIES

Citizen scientists can fill in gaps in crucial baseline knowledge about a river’s species or general health. Without detailed information about existing populations, we don’t even know what we might lose.

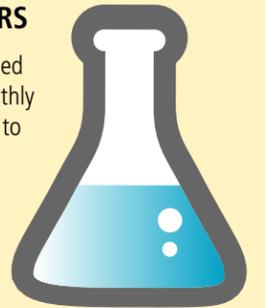
The Mekong River in Southeast Asia supports several species of giant fish. Very little is known about them. More information is needed on where they spawn, what natural cues drive them to spawn, population estimates, and maps of their life-cycle territory. Dams on the mainstem would threaten 4 of the world’s 10 largest fish.



BECAUSE THEY’RE OUR RIVERS

Volunteers for the Mystic River Watershed Association in the Eastern US take monthly samples at 15 locations along the river to monitor water quality. Advocacy based on their results has helped improve the river’s cleanliness.

“We help get residents involved in their natural environment through hands-on science,” said watershed scientist Katrina Sukola. “After all, the river belongs to everyone.”



For a toolkit on how to create a citizen science program see: <http://www.birds.cornell.edu/citscitoolkit/toolkit>

CITIZEN SCIENCE IN ACTION: A STEP-BY-STEP CASE STUDY *Fishing Villagers Document Mekong River’s Natural Wealth*

IDENTIFY THE QUESTIONS YOU WANT TO ANSWER

In 1994, Thailand built Pak Mun Dam on the largest tributary of the Mekong, destroying local fisheries and harming river-based communities. Information on local fisheries was scant.

In 2001, the Thai government relented to international pressure and ordered the dam’s floodgates opened for a one-year study of its impacts to fisheries and communities.



FORM A RESEARCH TEAM

South East Asia Rivers Network (SEARIN) and Assembly of the Poor teamed up to monitor the changes caused by the dam. Their innovative citizens’ science research method, called Thai Bahn (Thai Villager) research, relied on local fishers to gather information.

DEVELOP A PLAN OF ACTION

Methods, areas of study, and research team members were all decided by the local villagers. SEARIN helped write up their findings and increase international awareness.



DOCUMENT YOUR FINDINGS

The natural flows of the one-year trial period allowed people to resume traditional ways of life and eased resource conflicts among river communities. Local fish species not seen for eight years came back; researchers found a total of 156 fish species had returned to the Mun River.



ANALYZE YOUR DATA

SEARIN helped create a report on the team’s findings, in two languages. The report is considered one of the most thorough documentations of Mekong fisheries produced for that area.

SHARE YOUR FINDINGS, AND USE THEM FOR ACTION

Thanks to this citizen science effort, the villagers succeeded in getting the Thai government to open the dam gates for four months each year to allow for fish migration, although subsequent governments have unfortunately reneged on this agreement. But the project has inspired many other citizen science projects to protect rivers in the region.

