

Overfishing threatens inland waters, study concludes

December 2 2005

Overfishing of inland waters is a neglected crisis, according to a team of freshwater ecologists and fishery scientists led by a University of Michigan professor. Although overfishing is widely recognized, freshwater species are rarely mentioned because most of the focus is on marine species.

“There are many parallels,” said David Allan, professor of conservation biology and ecosystem management. “Both marine and freshwater harvests have increased dramatically since the middle of the 20th century, and now show signs of reaching their upper limit. Fishers first depleted larger, more valued or more easily captured species and then shifted their efforts to remaining species, often lower in the food web.”

An article on the topic, “Overfishing in Inland Waters,” appears in the current issue of *BioScience*, produced by the American Institute of *Biological Sciences*.

The article notes that because fishers are able for a time to deplete a succession of species, yields appear constant while biodiversity declines and the overall fishery is pushed to its limits. As a result, the precarious state of the fishery is not immediately apparent. Heavily exploited fisheries of the Mekong River are a good example, Allen says.

The Great Lakes provide an early case study in sequential overfishing of a series of species. Cisco (*Coregonus artedii*) experienced a collapse in the mid-1920's, and then lake whitefish (*Coregonus clupeaformis*) were

severely exploited through the 1930s. Typical of overfishing of more than one species, overall catch increased even while regional populations of both species were depleted, the report says.

But there are important differences between freshwater and marine species also, the study says. Species-level records are rare for the capture fisheries of fresh waters, so it is difficult to document declines in individual species. Catches often are dispersed and unrecorded, especially when fishing is illegal, for local markets or for sustenance. And overfishing is not as dominant a threat as in the oceans because dams, pollution and habitat degradation pose additional challenges to the fisheries of inland waters and to the ecosystems that sustain them.

“Tens of millions of people in developing countries fish inland waters for food, and fishing is the employment of last resort in many poor, rural areas” Allan said. “Ensuring that these fisheries are managed sustainably benefits many and at the same time contributes to biodiversity conservation”.

Roughly two-thirds of the reported catch from inland waters comes from Asia, and the authors illustrate the intensity of fishing pressure with examples from the Mekong River. The Mekong giant catfish, possibly the world’s largest freshwater fish at 300 kg, is seriously threatened. But most fishing pressure falls on the small minnows, called trey riel, which are harvested by a variety of traps and nets from a flotilla of boats and floating villages. The Cambodian currency, the riel, derives its name from these fish.

To meet the complementary goals of sustaining yields while maintaining biodiversity, local communities must derive economic and social benefits from the fishery, the authors say. But managing the fishery through catch regulations and no-take zones will not be enough. Protection from other human-induced stresses such as dams, invasive

species, pollution will also be critical.

Study authors include Allan, Robin Abell, World Wildlife Fund in Washington, D.C.; Zeb Hogan, University of Wisconsin; Carmen Revenga, The Nature Conservancy; Brad Taylor, University of Wyoming; Robin Welcomme of the Long Barn in Suffolk, England; and Kirk Winemiller of Texas A&M University.

For more information about Allan, visit:

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Source: University of Michigan

Citation: Overfishing threatens inland waters, study concludes (2005, December 2) retrieved 26 April 2024 from <https://phys.org/news/2005-12-overfishing-threatens-inland.html>

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