

Project: International Symposium on the Biological Responses of Sturgeons to Anthropogenic Pollution.

Purpose: To bring toxicologists and sturgeon biologists together from various nations to share knowledge and stimulate collaboration for understanding pollution impacts on sturgeon populations around the world.

Significance: Ancient sturgeons, nearly indistinguishable from contemporary species, swam in waters from which the dinosaurs drank. They fed the first hominids, the early colonists of several continents, and today's gourmets. Sturgeons are found across the globe in the northern hemisphere; their study greatly influencing the science of fish classification and our understanding of fish evolution. Yet, despite their legacy and contemporary importance, we know very little about these unique animals; especially in North America. The task of understanding their biology and ecology is made ever more difficult and urgent since most of the 29 sturgeon species are threatened or endangered in at least some of their habitat. Many are nearing extinction.

Worldwide, efforts are underway to study these animals before they disappear from the planet: <http://www.worldsturgesociety.com>. Studies range from research into taxonomic relationships among the species to understanding the environmental conditions necessary for spawning and rearing of young. Several population-level investigations have suggested that declines are associated with over-fishing, habitat alterations, and pollution. Notably, these ecosystem-wide studies have predominantly focused on the impacts of over-fishing and habitat change. Comparatively little effort has been directed at understanding the role that chemicals and environmental pollutants may play (e.g., temperature, radiation and sewage). In part, this focus is due to the obvious deleterious impacts of damming and channelization on the fisheries of the great rivers. It is also due to our past experience with the devastation of over-fishing on important marine and freshwater food fisheries.

That pollutants may also play an important role in the demise of sturgeon species is suggested by their long life-span, extended period of puberty, high fat accumulation, benthic feeding behavior, and migratory nature; characteristics that make them especially vulnerable to pollutants. Furthermore, the abnormalities in morphology, reproduction, and physiology reported for wild-caught sturgeons are similar to those that have been observed in other fish species known to be exposed to pollutants.

Only by establishing all the causes of sturgeon declines can appropriate strategies be designed to protect and recover these species. To date, the significant obstacles to achieving that understanding have included the rarity of individuals for study, the difficulty of working with such large animals in laboratory settings; lack of understanding of basic biology and normal physiological characteristics; lack of appropriate reagents for measuring responses in bioassays; and the inherent difficulties in linking exposure and effect in complex ecosystems experiencing damage from multiple sources. The latter has to some degree been successfully addressed in similar instances using a weight-of-evidence approach. An international symposium of experts

focused on the health of sturgeon in polluted environments could bring a substantial body of evidence to this topic.

Our Proposal: We propose to convene a special conference session devoted to the topic of environmental pollutants and sturgeon biology. Our objective is to gather sturgeon scientists working in the area of sturgeon health or toxicology from countries throughout the world representing the diversity of sturgeon species. The session would include both oral presentations and exhibited posters. Additionally, round-table discussions will be arranged to facilitate exchange and a conference proceedings containing the scientific results presented will be published and distributed.

Where and When: The conference session will take place in conjunction with the biennial conference, Modern Problems of Toxicology, held at the Russian Academy of Science s Institute for Biology of Inland Waters (IBIW) in Borok, Yaroslavl, Russia (<http://www.ibiw.ru/>). The conference is scheduled for September, 2005. Russia s premier sturgeon scientists have studied the biology of sturgeons for over a century. Furthermore, the IBIW venue provides an intimate secluded campus environment for scientists to communicate and exchange ideas. The IBIW also has resident translators, meeting rooms, and hotel and cafeteria accommodations at a very reasonable cost. The location is also central to many other countries with sturgeon populations of importance. Scientists can fly into Moscow, and the IBIW would provide transportation to and from Borok.

Who will benefit. How we will communicate our results: This will be the first international gathering of scientists to discuss pollution impacts on sturgeons. Biologists, managers, funding organizations and environmental groups will benefit from this conference, but the ultimate beneficiaries will be sturgeon populations world wide. In addition to publication of the reports presented by the participants as a conference proceedings, articles describing the conference and summarizing its findings will be published in the Journal of the American Fisheries Society and on the webpages of the World Sturgeon Society. Sponsors of this important meeting will be acknowledged in all publications associated with the event. Through support of this conference, benefactors will have an opportunity to support scientific research and have the satisfaction of aiding the international effort to save sturgeon populations from extinction.

Funding Requested: The IBIW and the US Geological Survey (<http://www.usgs.gov>; www.cerc.usgs.gov) will co-chair the meeting and provide substantial in-kind support. We request \$35K to defray costs of the meeting. The funds will be used to cover travel for selected participants, logistical support for the conference, and publication costs of the proceedings. A steering committee will be developed to select participants and determine those in need of travel assistance.