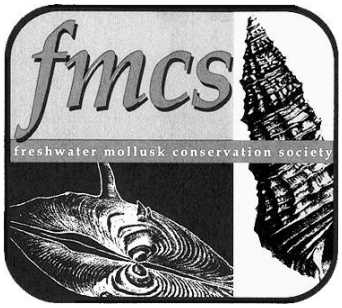

April 17, 2007

Mr. Benjamin Grumbles
Assistant Administrator
U.S. Environmental Protection Agency
Ariel Rios Building
Office of Water
1200 Pennsylvania Avenue, N.W.
Mail Code: 4101M
Washington, D.C. 20460

Dear Mr. Grumbles,

The Freshwater Mollusk Conservation Society (FMCS) is writing to request that national water quality criteria standards for ammonia be revised to include studies on the effects of ammonia on freshwater mussels. FMCS is an international organization that has expertise in a wide range of issues related to freshwater mollusks, including toxicity, through our membership.

Freshwater mussels are among the most imperiled groups of animals we have in the United States (Master *et al*., 2000). To date, 72 species are considered endangered (USFWS, 2007), 35 species are believed to be extinct (Neves *et al*., 1997), and 70% of the fauna is considered imperiled (Williams *et al.*, 1993). Freshwater mussels provide numerous benefits to U.S. citizens, such as particular cost-free water filtration and streambed stabilization (Vaughn and Hakencamp 2001), and a benefit to stream insects through increased abundances of macroinvertebrates (Vaughn and Spooner, 2006).

The associations between ammonia sources and mussel declines in the wild were noted several decades ago (Starrett 1971, Horne and McIntosh 1979). Those observations led to laboratory work on ammonia toxicity to mussels (Wade 1992, Goudreau *et al.*, 1993). Published synthesis of those works and other mussel ammonia data highlighted it as a pollutant of concern for this group of organisms (Augspurger *et al.*, 2003). The importance of the issue, in part, led to recent additional testing and method development (Wang *et al.*, 2007a,b,c; Newton and Bartsch, 2007), which allowed refinement of earlier estimates of safe concentrations. These new measured values can be used, by virtue of the newly available standards for data acceptability (ASTM 2006), in deriving water quality criteria, state water quality standards, effluent limits, clean-up values, and toxicity reference values for mussel conservation.

All of these new data for mussels and ammonia are forthcoming in 2007 in the Journal *Environmental Toxicology and Chemistry*. You will find that Wang *et al.* (2007b) offer a wealth of additional data on ammonia toxicity for freshwater mussels which indicate the acute and chronic ammonia recommendations (Augspurger *et al.*, 2003) are still reasonable.

Specifically, adding acute toxicity data for tests conducted since 2003 (Wang *et al.*, 2007b) and applying the ASTM International (2006) standard guide (for test duration and test acceptability) results in a dataset with 50 24- to 96-h LC50s to calculate nine unionid Genus Mean Acute Values (GMAVs), five of which are more sensitive than any GMAV in the existing USEPA criteria document (USEPA 1999). Since 2003, Wang *et al.* (2007c) have conducted 28-day ammonia exposures with three species of freshwater mussels. Endpoints included survival (foot movement) and growth (shell length), and chronic values (geometric mean of the lowest observed effect concentration and no observed effect concentration) for the three tests were <0.4, 0.4 and 0.7 mg total ammonia as nitrogen (TAN)/L. These new measured chronic values are within the range of safe concentrations estimated in 2003 (Augspurger *et al.*, 2003) with acute data and acute-to-chronic ratios (0.3 to 1.0 mg TAN/L at pH 8 and 25ºC). With empirically derived chronic values well below USEPA criteria continuous concentrations, data continue to mount indicating the need to revise ambient water quality criteria for ammonia to be protective of mussel species tested.

It is with these things in mind that we strongly urge the U.S. EPA to incorporate ammonia criteria for freshwater mussels into national standards as well as support research initiatives into other water quality and habitat degradation issues of our imperiled mussel fauna.

Thank you in advance for your consideration in this matter.

Sincerely,

Steve Ahlstedt, President
Freshwater Mollusk Conservation Society

Cc: American Fisheries Society
American Malacological Society
North American Benthological Society
Society of Environmental Toxicology and Chemistry
United States Fish and Wildlife Service
United States Geological Survey

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