The Illinois Chapter *of the* American Fisheries Society

founded 1963

PC #1

June 14, 2004

Illinois Pollution Control Board
100 West Randolph
Suite 11-500
Chicago, Illinois 60601-3286

Re: R 04-025

Dear Sir/Madam:

The American Fisheries Society was founded in 1870 and is the world's largest and oldest organization of professional fisheries biologists and aquatic resource scientists. The Illinois Chapter represents more than 250 fisheries and aquatic scientists within the State of Illinois. Our members include a diverse cross section of professionals from regulatory agencies, research institutions, universities, and private consulting firms. The Chapter has the expressed mission "to support the conservation and stewardship of the fisheries and aquatic ecosystems in Illinois by promoting professional excellence in fisheries science, management, and education." We recognize that the fisheries and overall aquatic biodiversity of Illinois are dependent on high quality water supplied by natural hydrologic cycles.

The Chapter has reviewed and debated the Illinois Association of Wastewater Agencies'(IAWA) proposed revisions to Illinois' dissolved oxygen standards. We have also reviewed the supporting documentation provided by James E. Garvey and Matt R. Whiles of Southern Illinois University in their April 2004 report entitled *An Assessment of National and Illinois Dissolved Oxygen Water Quality Criteria.* Although the Chapter commends Drs. Garvey and Whiles for the thoroughness of their review of the existing literature on the subject, their subsequent recommendations, in our view, are not adequately supported by the data.

Specifically, the Chapter is quite concerned by the proposal to lower the state's dissolved oxygen standard from its existing one-day minimum of 5.0 mg/L to a one-day minimum of 3.5 mg/L and a seven-day mean minimum of 4.0 mg/L during the period of July through February. Our arguments against the proposed revision are summarized as follows:

- Most of the research cited in the Garvey and Whiles report deals with acute, short term effects such as fish mortality associated with hypoxia. However, the authors admit "no standardized method for conducting acute tests with dissolved oxygen yet exists".

Further, studies of longer term, chronic effects, such as those involving growth, reproduction, and feeding, "are rarer than acute ones". This lack of empirical evidence does not support the conclusion that lowered standards of protection will result in little or no impairment of aquatic life.

- Nearly all of the work cited in the supporting document involves laboratory studies, presumably utilizing clean water subjected to controlled levels of dissolved oxygen. The results obtained may not be applicable to field conditions, particularly in Illinois, where fish and other organisms are subjected to a suite of physical and chemical perturbations involving temperature, sediments, pH, ammonia, nutrients and heavy metals. There are synergistic effects and interactions among these constituents which are difficult or impossible to replicate in a laboratory setting.

- The fish species utilized in earlier studies, particularly those referenced in Chapman's (1986) review, are primarily sport species and do not reflect the diversity of taxa or even ecological guilds present in Illinois' waters. For instance, Smale and Rabeni (1995) included only one sucker, the extremely tolerant white sucker, in their analysis. The sucker family has many Illinois representatives, some of which (e.g. the northern hogsucker and various redhorses), are quite sensitive to environmental stresses. Other than Smale and Rabeni, there are no studies cited which include minnows – numerically dominant in most Illinois streams – or darters, our most "intolerant" family of fishes as a whole.

- By categorizing fishes as either "coldwater" (salmon and trout) or "warmwater" (virtually everything else), the often cited Chapman report lumps all native, stream dwelling Illinois fish into the same tolerance category when, in reality, they present a continuum. More research is needed to critically examine the environmental requirements of the various "warmwater" fishes and to recognize more subtle variations in their needs. At the very least, an intermediate category such as "coolwater" should be applied to species including smallmouth bass, sculpins, daces and other fishes that are clearly limited in their geographic distribution by temperature and/or dissolved oxygen regimes.

- Streams supporting these less tolerant forms should be categorized with a different use designation than those in the southern part of the state which regularly show dissolved oxygen violations under "natural" conditions (that is, without point source effluent). A comprehensive statewide review of biological, physical and chemical data from Illinois' streams and rivers would provide the framework for assigning more specific designations than the current "general use". Standards for dissolved oxygen, as well as other constituents, could then be adjusted in a context of scientifically defensible, regional expectations.

- Although the Chapter understands and concurs with a seasonally stratified standard to reflect temporal changes in life history stages and their requirements, we believe the proposed March through June period recommended to protect "early life stages" falls short of doing so. Many important stream fishes (freshwater drum, flathead catfish, various minnows) spawn later into the summer, and their larvae are present into July. Therefore, if a temporally adjusted standard is applied, it should be extended at least through July 31.

In summary, the Illinois Chapter of the American Fisheries Society does not support relaxing Illinois' existing dissolved oxygen standards because insufficient evidence is available that such action will not have serious and irrevocable consequences for the state's aquatic biota – that is, the science does not support the proposed changes. The Garvey and Whiles report bears this out; the authors admit "many gaps in our knowledge", recommend further research to "develop more precise and meaningful criteria", and suggest "improved criteria that are relevant on a regional and habitat-specific basis". Such statements accurately depict the imperfect state of our knowledge and strongly argue for a more measured approach to changing standards.

The Chapter urges the Pollution Control Board to retain Illinois' existing dissolved oxygen standards unchanged pending additional critical research. At a very minimum, studies which involve a wider variety of native Illinois fish species and examine both acute and chronic responses to dissolved oxygen in concert with other typical chemical constituents are warranted. This must be coupled with a revision in Illinois' use attainability designations which is sensitive to the state's wide geographic and ecological diversity. To lower water quality standards now, given the uncertain but possibly severe consequences, would not serve the best interests either of Illinois' citizens or its aquatic resources.

Sincerely,

Robert W. Schanzle, President
Illinois Chapter
American Fisheries Society

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