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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
110 Radnor Road, Suite 101
State College, Pennsylvania 16801-4850



February 15, 2018

Environmental Quality Board
P.O. Box 8477
Harrisburg, PA 17105-8477

Re: Proposed Rulemaking, Triennial Review of Water Quality Standards
(*Pennsylvania Bulletin*, October 21, 2017)

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Dear Sir/Madam:

The U.S. Fish and Wildlife Service has reviewed the draft of the Proposed Rulemaking, Triennial Review of Water Quality Standards provided by the Environmental Quality Board. This Triennial Review proposes to amend Chapter 93 relating to water quality standards. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of federally listed, threatened and endangered species, and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*) to ensure protection of fish and wildlife resources.

Ammonia Criteria

The Service appreciates the Department of Environmental Protection's (Department) proposal to adopt the Environmental Protection Agency's (EPA) 2013 Aquatic Life Ambient Water Quality Criteria for Ammonia. As the agency responsible for the protection and recovery of federally listed endangered and threatened mussels, we concur that these criteria are warranted to protect listed species, as well as to prevent the need for listing additional mussel species. We support the application of criteria that are protective of freshwater mussels throughout Pennsylvania.

Chloride Criteria

The Department has not proposed chloride criteria for the protection of aquatic life on the grounds that insufficient information is available to derive values. Since the Department last proposed chloride criteria, two additional comparative studies have been published (Struewing *et al.* 2015; Wang *et al.* 2017) which demonstrate that organisms native to Pennsylvania are more sensitive to chloride than the laboratory organisms used to derive the current EPA chronic criteria for freshwater aquatic life. These results further demonstrate that chloride toxicity is highly likely to be affecting sensitive aquatic species in Pennsylvania watersheds. For this

reason, the Service has and will continue to insist that a chronic criterion of either 78 $\mu\text{g/L}$ chloride or 247 $\mu\text{S/cm}$ (Patnode *et al.* 2015) is warranted to prevent take of federally endangered and threatened mussels at relevant National Pollutant Discharge Elimination System (NPDES) discharges.

Under the Clean Water Act (33 U.S.C. § 1251 *et seq.*), the process for developing water quality standards takes into account that our understanding of toxicity advances with new studies. Numerous standards have been proposed by EPA and promulgated by the states only to be revised in subsequent triennial reviews. Since the last triennial review, the number of species tested for chloride sensitivity has continued to expand. Chloride criteria should be advanced in this triennial review following EPA methods and including sensitive native species such as mayflies, aquatic snails, and native freshwater mussels to protect existing uses. While the complex relationship to hardness needs to be further defined, the differences in the influence of hardness between cladocera and mayflies noted by the Department demonstrate that a hardness adjustment based on a single species is inappropriate. Further testing could demonstrate that hardness does not ameliorate chloride toxicity equally or at all for some species. Existing uses could be severely impaired and species extirpated in the time that it will take to develop a defensible model. In light of known toxicity, the Service contends that it is prudent to implement chloride criteria in this triennial review, regardless of the need for future modifications, to afford immediate protection of aquatic resources.

The Service supports the Department's consideration of field-based data in deriving water quality criteria to protect aquatic life from chloride toxicity. Thus, we encourage the Department to develop a conductivity standard using existing biological survey data. We also concur that conductivity is an easily-measured surrogate for complex ionic mixtures and the local water chemistry interactions. Using conductivity is likely the most expedient means of accounting for differential toxicity due to variable water chemistry. We advocate that the Department derive eco-region specific conductivity criteria following the EPA method (EPA 2011) for watersheds in Pennsylvania for this triennial review using existing data on water chemistry and biota. EPA's draft evaluation for eco-region 70 identifies a chronic exposure criterion of 340 $\mu\text{S/cm}$ (95% CI of 272-365 $\mu\text{S/cm}$) as being applicable in PA, WV, KY and OH.

The Service recognizes that a third approach to implement protection in this triennial review is to revise the current ineffective criterion for osmotic pressure to protect aquatic life from chloride toxicity. The criterion for osmotic pressure allows a maximum of 50 milliosmoles per kilogram (mOs/kg) in surface waters, which is equivalent to conductivity of 3817 ($\mu\text{S/cm}$) based on the modified equation from Cravotta and Brady (2015). Existing studies clearly document toxic effects to native aquatic biota at conductivity values an order of magnitude lower (EPA 2011; Cormier *et al.* 2013a; Cormier *et al.* 2013b; Pond *et al.* 2008). As noted above, the draft eco-region 70 evaluation found aquatic life use impairment and macroinvertebrate extirpation at conductivity values above 340 $\mu\text{S/cm}$ (4.5 mOsm/kg; 95% CI of 3.6-4.8) (EPA 2016). At more than 10 times greater, the current osmotic pressure standard is allowing existing uses to be impaired. Highly sensitive organisms such as some mayflies and stoneflies (Stroud Water Research Center 2015; EPA 2016) and mussels (Patnode *et al.* 2015) are likely to be extirpated under chronic exposure. In the light of the current science, the Service recommends that the

Department conduct an analysis of osmotic pressure and benthic macroinvertebrate survey data to generate an osmotic pressure criterion that protects aquatic life uses for this triennial review.

Other Criteria with EPA updates absent from the Triennial Review

The information provided in the Proposed Rulemaking does not include an explanation for limiting the application of the Biotic Ligand Model for Copper to site-specific criteria development. The Service supports statewide application of this model.

The Proposed Rulemaking also lacks a proposal for the adoption of tissue-based selenium criteria for the protection of aquatic life (Aquatic Life Ambient Water Quality Criteria for Selenium - Freshwater, EPA-822-R-16-006, June 2016). Given the high bioaccumulation potential of selenium, the Service advocates that this tissue sampling approach should be included in this triennial review to augment water concentration standards.

Delaware River Designated Uses and Dissolved Oxygen Criteria

Establishing a higher dissolved oxygen standard (i.e., 5.0 mg/L) in Zones 3, 4 and 5 of the Delaware River is necessary to protect populations of migratory fish species that depend on that portion of the river for spawning and/or nursery habitat. Species of interest include the Atlantic and Shortnose Sturgeon (both federally listed), American Shad, Striped Bass, Alewife, Blueback Herring, and Atlantic Menhaden. An evaluation of species occurrence and use of this portion of the river was conducted by the Delaware River Basin Commission in 2015 (DRBC 2015).

Atlantic sturgeon, (*Acipenser oxyrinchus*) a species that is both state and federally listed as endangered, has recently been shown to have had several years of successful reproduction in the lower river (Zones 4 and 5, Hale et al. 2016). Peak abundances of young-of-the-year captures of Atlantic sturgeon have occurred in years when the summer dissolved oxygen levels have been higher in the estuary (DRBC 2015). Atlantic sturgeon are susceptible to low dissolved oxygen during their early life stages (Secor & Gunderson 1998). In order to protect and restore this species by ensuring continued successful spawning, it is necessary to have a higher dissolved oxygen standard established for the estuary.

The related shortnose sturgeon (*Acipenser brevirostrum*), which is also state and federally listed as endangered shows evidence that their distribution is restricted in the lower portion of the river by low dissolved oxygen levels during the summer months (Hastings *et al.* 1987). Based on radio telemetry data, it appears that shortnose sturgeon, in part, utilize the river in the vicinity of Philadelphia during the species seasonal migration. Steps should be taken to ensure that suitable dissolved oxygen are available here to protect sturgeon traveling to that area (O'Herron et al. 1993).

In additional to the above endangered species, other migratory fish species of interest, including American shad, striped bass, alewife, blueback herring, and Atlantic menhaden, utilize the lower Delaware River and estuary as spawning and/or nursery habitat. All of these species are intensively managed by the Atlantic States Marine Fisheries Commission and support commercial and/or recreational fisheries on the Atlantic Coast and tributaries, including the

Delaware River and Bay. All of these species would also benefit from increased dissolved oxygen level in the lower river to support survival of their eggs, larvae, and juveniles. Thus, the Service advocates adoption of 5.0 mg/L for Zones 3, 4 and 5.

Thank you for the opportunity to comment. For questions related to dissolved oxygen, please contact Sheila Eyler of the Mid-Atlantic Fish and Wildlife Conservation Office at 410-573-4554 or sheila_eyler@fws.gov. Please direct any other questions to Kathleen Patnode of my staff at 814-234-4090 x7450 or kathleen_patnode@fws.gov.

Sincerely,



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