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Elder Ghigiarelli Jr.  
Deputy Program Administrator,  
Wetlands and Waterways Program,  
Water Management Administration,  
Maryland Department of the Environment  
1800 Washington Boulevard, Suite 430,  
Baltimore, MD 21230

Dear Mr. Ghigiarelli:

I am writing this letter to summarize my oral testimony of 5 December 2017 at a public hearing organized by the Maryland Department of the Environment regarding the relicensing application for the Conowingo Dam. By way of background, I hold a Ph.D. from the University of Kansas and have been active in scientific research on the conservation and wildlife management of reptiles and amphibians since 1975. I have published over 75 peer-reviewed publications on reptiles and amphibians, as well as five books. I am currently a full Professor of Biology at Towson University, having previously held positions at the University of Georgia and Southeastern Louisiana University.

My testimony concerned the current status and viability of the Northern Map Turtle (*Graptemys geographica*), a state-endangered turtle whose range in Maryland is confined to the lower Susquehanna River and its drainages. Like many riverine turtle species, populations of map turtles in the US are threatened by commercial harvesting for the pet trade, habitat modifications, and by human recreational activities.

Our research on this species has been conducted since 2008 and has included studies on the distribution, diet, movement patterns, nesting ecology, basking behavior, and population ecology. This work has been funded by multiple state, federal, and private entities, including the Maryland Department of Natural Resources, the Maryland State Highway Administration, the U. S. Fish & Wildlife Service, and Exelon Corporation.

The primary focus of my testimony of 5 December 2017 was to update the Maryland Department of the Environment and the public on the status of the Northern Map Turtle, with emphasis on current threats to its population viability. More information on our research can be found in a variety of

published papers and reports to the state and private entities noted above, most or all of which are available as public documents.

Our data show that (1) there is a reproductively-active population of Northern Map Turtles in the lower Susquehanna River, both below and above the Conowingo Hydroelectric Dam, with most turtles concentrated in a 1.9 km linear area from the upriver end of Roberts Island to the downriver end of Spencer Island across from Susquehanna State Park; (2) The diets of Map Turtles differ greatly between genders, with females concentrating primarily on pleurocerid snails and males on small gastropods; (3) Nesting occurs along relatively open areas along the banks of Octoraro Creek, on Wood Island, and in the town of Port Deposit, but most nesting areas are heavily disturbed by humans and most nests are destroyed by predators; (4) Nest success can be increased substantially by caging nests immediately after egg-laying is completed; (5) Northern Map Turtles bask on rock outcroppings, large woody debris, and manmade structures (e.g., bulkhead footing and rip-rap) below the dam, but basking activity is heavily influenced by both water releases from the Conowingo Hydroelectric Dam and by recreational boating activities.

The primary threats to the continued viability of this population include the following issues; (1) Lack of recruitment of hatchlings due to high predation rates on nests, (2) Disturbance to adult females while basking from recreational boaters and rapid water level rises from the Dam, (3) Invasive vegetation overrunning the current primary nesting sites, (4) Possible by-catch from commercial fish harvesting, and (5) Potential impacts of the planned dredging in summer 2018 immediately upstream of the Conowingo Dam, in the so-called "Pond".

Research studies funded by the entities noted above have provided specific management recommendations to alleviate or eliminate the threats from the first three issues. However, the impacts from by-catch from commercial fishing and from the planned dredging in the "Pond" upstream of the Dam in the summer of 2018 remain unstudied and no data are available to indicate what impacts these activities may have (or, in the case of commercial fishing, may already have had) on the Northern Map Turtle.

It is somewhat ironic that the two unresolved threats to the continued viability of this endangered species are from activities permitted by state agencies without any input from the biologists studying said species. Additional information on both of these threats is needed badly if the continued existence of this endangered turtle is to be assured in Maryland. This information should be available before permits allowing these activities to continue are issued.

Please let me know if you need any further information.

Sincerely,

A handwritten signature in cursive script that reads "R. A. Seigel".

Richard A. Seigel  
Professor

