



**FRESHWATER MOLLUSK CONSERVATION SOCIETY
1417 HOFF INDUSTRIAL DR.
O'FALLON, MO 63366**

February 5, 2017

Michael Moxey
U.S. Army Corps of Engineers
Attn: Regulatory Division
P.O. Box 2288
Mobile, AL 36628

RE: FMCS Comments on Environmental Impact Statement for the Pat Harrison Waterway District and George County Proposed Big Cedar Creek and Little Cedar Creek Dams (Public Notice Number SAM-2014-00653-MBM)

Dear Colleagues,

The Freshwater Mollusk Conservation Society (FMCS) is dedicated to the conservation of, and advocacy for freshwater mollusks, North America's most imperiled animals. FMCS is an international professional scientific society made up of state, federal, academic, and private scientists and conservationists, many of whom work directly with the more than 200 endangered and threatened freshwater mollusks found worldwide. Our members are considered experts in the conservation and recovery of freshwater mollusks. The FMCS is writing in response to the "Request to construct two connected water supply lakes for maintaining Pascagoula River flow resiliency during prolonged severe droughts, George and Jackson County, Mississippi".

As largely sedentary organisms, freshwater mollusks are unable to escape disturbances, making them extremely vulnerable to alterations in the natural flow and temperature regimes. Deviations from natural patterns of flow and accompanying temperature and water quality changes can affect freshwater mollusks through altered reproductive cues, juvenile rearing conditions outside the natural range of variability, altered patterns of deposition and erosion, effects on host fish behavior, and alteration of instream productivity; all increasing the risk of population declines. Several studies have demonstrated that water management practices employed in many parts of the U.S. are not protective of freshwater mollusks, particularly for threatened and endangered species.

As with other aquatic organisms, freshwater mollusks time their life history events around predictable patterns in flow and temperature. Altered flows may: fail to provide necessary cues to stimulate gametogenesis and spawning; result in unsuitable habitat for juvenile survivorship; or result in an asynchrony between reproductive timing and host fish availability for species with parasitic larvae. Therefore, altered flow regimes could result in loss of juvenile recruitment in already declining populations.

Freshwater mollusks also provide a number of important services to the streams, rivers, and lakes in which they reside. Deviations from natural hydrologic conditions has been shown to influence the ecosystem services provided by these species, impacting important water quality parameters such as water clarity and nutrient concentrations. Therefore, altered flow regimes may not only directly affect the mollusks themselves, but potentially could cause cascading ecosystem level effects.

The Pascagoula River system supports 33 native freshwater mussel species (Jones et al., 2005), including 8 imperiled species (1 threatened and 7 which are special concern) (Williams et al., 1993). These include the following: rayed creekshell (*Anodontoidea radiatus*), delicate spike (*Elliptio arca*), Alabama spike (*E. arcata*), southern pocketbook (*Lampsilis ornata*), southern hickorynut (*Obovaria jacksoniana*), Alabama hickorynut (*O. unicolor*), Mississippi pigtoe (*Pleurobema beadleianum*), and purple pimpleback (*Quadrula refulgens*). The rayed creekshell and Alabama spike are under review for listing by the U.S. Fish and Wildlife Service. An additional species (white heelsplitter, *Lasmigona complanata complanata*) is imperiled at the state level, which may be significant for the genetic diversity of the species. While none of these species are protected under the Endangered Species Act, the FMCS strongly urges the U.S. Army Corps of Engineers to consider all impacts of the proposed dam construction projects on freshwater mollusks.

We urge the USCOE to fully evaluate the effects of these proposed dams on native freshwater mollusks during the EIS development. The ecosystem services provided by native mollusks are substantial and habitat alteration via flow alteration or stream inundation can diminish population viability, and the loss of connectivity may disrupt gene flow necessary for long term adaptability in the face of changing land use and climate change. The U.S. Environmental Protection Agency and U.S. Geological Survey produced a technical report titled "Final EPA-USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration" which should be consulted for this EIS. The hydrologic alteration assessment framework outlined in the document may serve as a guide for the EIS process. Members of the FMCS are available for consultation during the EIS to help the USCOE assess impacts on native mollusks of the Pascagoula River system.

Thank you for your consideration of native freshwater mollusks during the development of this EIS. We contribute these comments in the interest of improving the environmental compatibility of the permitting decisions.

References:

Jones, R. L., W. T. Slack, and P. D. Hartfield. 2005. The freshwater mussels (Mollusca: Bivalvia: Unionidae) of Mississippi. *Southeastern Naturalist*, 4(1):77-92.

Williams, J. D., M. L. Warren, Jr., K. S. Cummings, J. L. Harris, and R. J. Neves. 1993.
Conservation status of freshwater mussels of the United States and Canada. Fisheries,
18(9): 6-22.

Sincerely,

A handwritten signature in cursive script, appearing to read "J.D. Williams", with a long horizontal flourish extending to the right.

President-Elect
Freshwater Mollusk Conservation Society