

## PhD Dissertation Defense

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**Title:** Histological And Geospatial Analysis Of The Mystery Snail (*Bellamya* Spp.) Populations In The Potomac And Occoquan Rivers Utilizing Citizen Scientist Participation

**Dissertation Director:** Dr. Dann Sklarew

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### ABSTRACT

*Bellamya chinensis* and *Bellamya japonica* are two non-native gastropods commonly referred to as “mystery snails.” Originally transported from Asia and sold as a food commodity or ornamental garden species more than 100 years ago, the snails are now found across North America, including areas within the Potomac River watershed near the George Washington Memorial Parkway, Mason Neck State Park, Belmont Bay, and Occoquan Bay. These areas comprise the study area for this research. Despite their widespread distribution, the morphology and possible impacts of *B. chinensis* and *B. japonica* on native freshwater ecosystems are poorly understood in North America, as is the taxonomic classification of the two species. The purpose of this study was to perform a spatial analysis of *Bellamya* spp. within the waters of the study area for relationships with water quality metrics (pH, water temperature, oxygen reduction potential (ORP), and electrical conductivity (EC)), and a histological analysis of collected snails for morphological variation. Findings from the spatial and water quality measurements revealed a correlation between the snails’ external shell measurements and oxygen reduction potential (ORP) as evidence indicating the mystery snails have adapted to larger ranges of pH, electrical conductivity, and temperature than previously noted in literature. Additionally, the histological studies reveal conflicting results for species identification. Results from these studies will aid natural resource managers in developing invasive species management activities for *Bellamya* spp. within the Potomac River watershed, and will contribute to the scholarly debate concerning the snails’ taxonomic assignments.