

# Classification and Ordination of Freshwater Mussel Communities in the Appalachians

**Alison R. Mynsberge**, *USGS West Virginia Cooperative Fish and Wildlife Unit, 322 Percival Hall, West Virginia University, Morgantown, WV 26505*

**George Merovich**, *Wildlife and Fisheries Resources Program, 322 Percival Hall, West Virginia University, Morgantown, WV 26505*

**Jacquelyn M. Strager**, *Natural Resource Analysis Center, 2010 Agricultural Sciences Building, West Virginia University, Morgantown, WV 26505*

**Michael P. Strager**, *Division of Resource Management, 322 Percival Hall, West Virginia University, Morgantown, WV 26505*

**Patricia M. Mazik**, *USGS West Virginia Cooperative Fish and Wildlife Unit, 322 Percival Hall, West Virginia University, Morgantown, WV 26505*

---

*Abstract:* The Appalachian Region contains the greatest diversity of freshwater mussels in the world. Freshwater mussels are also the most endangered taxa in the United States. Although small-scale studies have identified threats to mussel fauna, few studies have examined patterns in decline at the watershed scale. Mussel community types are not widely used in the literature, making it difficult to propose appropriate sampling designs for large-scale research. Describing mussel communities provides a framework for extrapolating research findings from local studies to a regional scale and gives researchers the ability to design sampling regimes that appropriately represent mussel community types. Our study therefore 1) evaluated potential classification strategies for freshwater mussel communities in the Appalachian Region, and 2) explored the relationships between mussel communities and environmental variables on a landscape scale. Cluster analysis showed that two-digit hydrologic unit drainage regions were the best classification strategy examined in this study. Non-metric multidimensional scaling ordination showed that gradient structure among communities corresponded with the drainage region classification strategy and was related to fish species richness, pH, elevation, and slope across the study area as well as within each drainage region. Classification tree analysis confirmed that drainage regions formed a good classification and identified fish species richness, pH, elevation, and land use as significantly differentiating the regions. These findings suggest that caution should be used in extrapolating research findings from freshwater mussel communities across drainage region boundaries because community assemblages differ widely among drainage regions.

Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 61:108