Innovative Restoration Aquaculture of Freshwater Mussels in the Tidal Freshwater Zone of the

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Mussel beds provide valuable ecosystem services, but freshwater mussels are now one of the most imperiled groups of any plant or animal in North America, with over 70% of species either endangered, threatened, or of special concern. The Mussels for Clean Water Initiative is a program headed by Partnership for the Delaware Estuary (PDE) to restore mussel beds throughout the Delaware River and Bay watershed in recognition of the water quality and habitat benefits they provide. The goal of this study is to develop and test new aquaculture methods that overcome the mortality bottleneck between hatchery propagation and mussel bed restoration. PDE will coordinate the propagation of up to 15,000 juvenile mussels, produced at a US Fish and Wildlife Service (USFWS) fish hatchery, to be used to optimize mussel rearing methods within several ponds in Delaware, New Jersey, and Pennsylvania and for analysis of results to help inform future mussel rearing techniques. The focus of this innovative research is to better understand rearing techniques and conditions to successfully return native mussels to streams in the Delaware Estuary watershed.

The short-term goal is to remove any "post-hatchery bottlenecks" that could impede expansion of the MUCWI program in this region. The long-range goal is to boost mussel populations to healthy, self-sustaining levels, including diverse native mussel species that can persist with climate change, across the study region of the estuary program. The main objectives of this project are to test and compare various methods and rearing sites to maximize growth of hatchery-produced juvenile freshwater mussels at pond sites in Delaware/Pennsylvania/New Jersey, analyze results to develop refined methods for large scale hatchery production grow out, and expand outreach and education about the need for propagation and rearing of freshwater mussels for water quality improvement in the Delaware River and Bay watershed.