



**CESU Final Report Summary for
Genetic Analysis of the Federally Endangered Winged Mapleleaf Mussel to Aid Proposed
Reintroduction Efforts**
W912HZ-09-2-0028

<p>Purpose: ERDC has a plan to reintroduce <i>Quadrula fragosa</i> into uninhabited sections of the St. Croix River. Study will conduct a genetic analysis to estimate the effective population size for this mussel, along with the number of female donors required.</p>
<p>Location: St. Croix River between Minnesota and Wisconsin.</p>
<p>Methods: Take 30-50 tissue or buccal swab samples from mussels in this population, estimate the effective population size to include female diversity, track lineage of new recruits, and provide status, draft and final reports. Microsatellite data will be generated in the Roe Lab at Iowa State Univ. A total of 53 microsatellite markers were screened for polymorphism in <i>Q. fragosa</i> resulting in 20 polymorphic loci for use in the study .</p>
<p>Results: Recommendations for effective population size to include required female donors. The effective population size for the St. Croix <i>Q. fragosa</i> population was estimated as $N_e = 149.2$ individuals. Using as few as 10 founders will thus retain 95% of the variation in the original population. It has been stated that in the initial phase of population founding or recovery the priority should be placed on producing a large number of individuals to avoid the additional loss of alleles which would happen if the population was kept small ($<500 N_e$) over multiple generations. ML-Relate estimates there are nine pairs of individuals that related at the same level as full siblings, and seventy-four pairs of individuals that are related at the same level as half-siblings. The remaining pairs of individuals (606) have values for r that indicate they are “unrelated.”</p>
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