

Preservation of Genetic Variation within Aquaculture Stocks  
of White Sturgeon (*Acipenser transmontanus*)

By

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## **CHAPTER 2. Estimation of parentage and relatedness in the polyploid white sturgeon *Acipenser transmontanus* using duplicated microsatellite loci.**

**Jeff Rodzen, Tom Famula, and Bernie May.**

### **Abstract**

We investigated the usefulness of microsatellite loci in the white sturgeon, *Acipenser transmontanus*, for estimating parentage and relatedness using algorithms developed for dominant markers. The microsatellite alleles were scored as independent dominant markers, which was then used with likelihood ratio statistics to estimate parentage. We tested three parentage scenarios: assignment to parent pairs, assignment to sires and dams independently when all possible parents were included (3 sires and 3 dams), and assignment to sires and dams when the true sires and dams were combined with a broodstock of 157 fish. Accuracy of assignment to parent-pairs exceeded 99%. Assignment accuracy to sires and dams independently was lower but we present methods to improve this accuracy even when the number of possible sires and dams is large. Pairwise relatedness estimates were also made for fish from known sib groups to test if the correct sib groups could be identified using the dominant marker approach. We investigated the use of the UPGMA clustering algorithm to identify sib groups from a matrix of relatedness values, which proved successful for identifying full sib groups. These results suggest our approach of scoring microsatellite alleles as dominant markers to be useful for parentage and relatedness applications.

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