

Population genetic structure between fall and spring spawned Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) in the Edisto River South Carolina

Farrae, D.J., T.L. Darden, and W.C. Post

South Carolina Department of Natural Resources

The Edisto River population of endangered Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) has a long sampling history. Evaluation of total length by capture day of year revealed a bimodal distribution of juveniles, allowing fish to be assigned to a fall or spring spawning event. We genotyped all sturgeon using a panel of 12 microsatellite markers to compare the genetic signatures of fall and spring spawned fish, assess the genetic 'health' of the population(s), and estimate effective population size ( $N_e$ ). Fall versus spring-spawned sturgeon were genetically different ( $F_{ST}=0.094$ ); pairwise year class comparisons supported these results. STRUCTURE analyses indicated two populations ( $k=2$ ) and identified fall and spring-spawned populations without any year class structure within a season. Observed heterozygosity for fall samples was 0.70 and for spring samples was 0.77; the inbreeding coefficient was effectively zero for both seasons. Overall estimates of  $N_{e(LD)}$  were 49.1 for fall and 14.0 for spring;  $N_{b(LD)}$  estimates by year class varied, but ranged from 20–30 per year class. Our results indicated that the Edisto River contains two genetically distinct populations of Atlantic sturgeon, one spawning in fall and the other in spring, and that both populations appear to have positive genetic 'health' metrics.