

Renewed Natural Reproduction of Atlantic Sturgeon in the Connecticut River and the Genetic Relationship of its Population to Others along the Atlantic Coast

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The “endangered” NY Bight DPS of Atlantic sturgeon was thought to only harbor two populations, in the Hudson and Delaware rivers. Historically, the Connecticut River likely supported a reproducing population, but that was believed extirpated decades ago. In 2014, we collected 47 juvenile Atlantic Sturgeon from the lower Connecticut River. To test the hypothesis that these specimens were descendants of a remnant ancestral population, we conducted mitochondrial (mtDNA) sequence and microsatellite analyses to compare this collection to 11-12 others coastwide. Mitochondrial DNA haplotype and microsatellite allelic frequencies differed significantly between the Connecticut River and all other populations coastwide. The Connecticut River collection did not share any mtDNA haplotypes with the other two populations in the NY Bight DPS. Interestingly, the Connecticut River collection was dominated by the E haplotype (87%, 41/47), which otherwise was only observed in specimens from the Carolinas and South Atlantic DPS, particularly the Altamaha River where it was seen in 39% (54/140) of specimens. STRUCTURE analysis of the microsatellite DNA results suggested that there were 10-11 clusters among the coastwide collections and that the cluster from the Connecticut River was distinct from those in all other rivers. This was supported by UPGMA analyses of both genomes. In AMOVA analyses, among region variation was maximized, and among population within regions variation minimized when the Connecticut River collection was separate from the other two populations in the NY Bight DPS. These results are most parsimonious with the likelihood that the Connecticut River hosted a small successfully reproducing population that may be descendants of recent colonists from a southern population. Because of the genetic similarity of the Connecticut River collection to others in the South Atlantic DPS, our findings introduce the question as to their DPS placement.