

Public Abstract

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Title:Hellbender (*Cryptobranchus alleganiensis*) gene flow within rivers of the Missouri Ozark highlands

Hellbenders (*Cryptobranchus alleganiensis*) are an aquatic salamander species experiencing dramatic declines in population size. These declines can be associated with a decrease in genetic diversity. Little is known about hellbender genetic variation at the within-river scale and whether habitat patches within rivers are genetically and/or demographically connected. Given that suitable habitat patches are isolated, and that hellbenders exhibit very little movement, gene flow may be restricted among these discrete habitat patches. I assessed fine-scale genetic relationships between hellbenders occupying various habitat patches within a river. My results indicate that a substantial amount of gene flow is occurring between habitat patches. Since dispersal (or the movement away from the natal habitat patch to a future reproductive patch) is the mechanism driving gene flow, it can be inferred from this data that hellbenders disperse. Using molecular techniques, I investigated sex-biased dispersal in hellbenders and found evidence to support dispersal in both male and female hellbenders. The results presented in my study are valuable for hellbender conservation, and have important implications for management. In particular, my results are informative for restorative release efforts and indicate that propagated hellbenders should be released back into the river of origin. Although release into a specific habitat patch is not warranted (given the lack of observable population genetic structure), attention should be paid to those habitat variables necessary for hellbender survival and settlement as described in previous studies.