Aquatic Habitat Degradation and Hybridization of Sunfish

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Aquatic habitat degradation can have many negative effects on species composition, ecosystem health, and biodiversity. Here, aquatic habitat degradation is defined as increased turbidity and excessive sedimentation of the stream-bed that results from surrounding urban land use and development. It is hypothesized that these two physical characteristics of streams have the greatest effect on hybridization of fishes, potentially leading to decreased biodiversity. The specific objective of this research was to determine if there is a correlation between substrate sedimentation, turbidity, and hybrid sunfish abundances. Hybridization between Bluegill (Lepomis macrochirus) and Green Sunfish (Lepomis cyanellus; an indicator of poor water quality), referred to as hybrid sunfish, was investigated. Additionally, species composition in degraded systems was investigated to determine the correlation between habitat quality and Bluegill abundances. Four sections of the Olentangy River, near the Ohio State University, specifically within a reach of the stream that has recently been restored, were sampled a total of three times each using standard fish collection techniques. This yielded the sunfish species composition for each site. The Ohio EPA Qualitative Habitat Evaluation Index (QHEI) was used to determine quality scores for total habitat quality, and various habitat characteristics, within each of the four sections of the Olentangy River. Preliminary analysis shows a negative correlation between the relative abundance of hybrid sunfish and total QHEI scores, substrate, in-stream cover, and pool quality, suggesting that there are more hybrids in lower quality habitats. Furthermore, preliminary analysis shows a positive correlation between the relative abundance of Bluegill and total QHEI scores, substrate, in-stream cover, and pool quality. These findings contribute to the current understanding of how degraded aquatic systems affect biodiversity. However, further analysis will be conducted to determine the habitat characteristics that produce the greatest influence on hybridization between Bluegill and Green Sunfish.