

American eel state of buoyancy and barotrauma susceptibility associated with hydropower turbine passage



American eel are likely to encounter and pass through hydropower turbines, particularly during the downstream spawning migration, where exposure to stressors can potentially lead to injuries and mortality. Previous research has recovered dead eels downstream of hydropower facilities and, for some fish, injuries were easily attributed to blade strike; however, others showed no external signs of injury suggesting that other stressors, such as rapid decompression may be a potential source of mortality. For this research, yellow- and silver-phase American eel were held and allowed to acclimate to 172 kPa (absolute pressure) in hyper/hypobaric hydro-chambers for about 1 d. After acclimation, the state of buoyancy was determined prior to exposure to a rapid decompression simulating pressures encountered during hydropower turbine passage. Fish were then examined for signs of barotrauma. Eel did not attain a state of neutral buoyancy but rather maintained negative buoyancy suggesting that eels, and possibly other benthic species, likely maintain a state of negative buoyancy to facilitate occupancy on or near the substrate. Additionally, eel were

found to be resilient to rapid decompression, displaying no instantaneous mortality and minimal injuries, suggesting that barotrauma is not likely a major concern for American eel passing downstream through hydropower turbines.

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