**The adaptive capacity of thermal tolerance: Reintroduction of Atlantic salmon into Lake Ontario**

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Climate change is projected to have widespread effects that could threaten the viability of natural populations. The ability of a species to adjust to climate change is modulated by its adaptive capacity, some of which involves an evolutionary response. Here we examine the adaptive capacity of Atlantic salmon, an important aquatic ectotherm. In the face of impending climate change, conservation managers may be faced with augmenting or reintroducing individuals that have high thermal tolerance or those from a population with high thermal tolerance. Indeed, current restoration efforts to produce a self-sustaining Atlantic salmon (Salmo salar) population in Lake Ontario focus on three source populations as candidates for reintroduction. In this study, we evaluate the underlying genetic architecture and hence one component of adaptive capacity of thermal tolerance in the three populations. Optima for performance were determined using maximum heart rate measurements (thermal optimum Topt, and critical temperature Tcrit) as a proxy for aerobic scope. Furthermore, we investigated underlying cellular and molecular factors that may facilitate tissue oxygen supply and thereby thermal tolerance at individual and family levels. The results of this study provide insight into long-term survival for ongoing restoration efforts of Atlantic salmon as well as more broadly into the thermal adaptive capacity of freshwater fishes.