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## **OBSERVING THE EFFECTS OF INBREEDING AND LOCAL ADAPTATION ON FITNESS IN WESTSLOPE CUTTHROAT TROUT POPULATIONS IN A COMMON GARDEN**

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Montana Westslope cutthroat trout (*Oncorhynchus clarkii lewisi*, WCT) populations, particularly those east of the continental divide, are predominantly small and isolated from one other. Small population size inevitably leads to a more inbred population and can lead to lowered fitness (inbreeding depression). Isolated populations may experience local adaptation, which increases the fitness of a population within its native habitat. If inbreeding is the greatest threat to a population, introducing individuals from another population might be the best management decision. However, if local adaptation has also occurred, introducing new individuals might lower the fitness of the population. Our goal was to evaluate the relative importance of inbreeding and local adaptation on fitness in several WCT populations. This study combines eggs from several populations of WCT into several different natural habitats. Remote-site incubators were used to introduce eggs to six sites over four years in the Cherry Creek drainage. Each year a colder and warmer site was selected to test for the potential of local adaptation to stream temperature. Electrofishing was used to sample above and below introduction sites one, two, and three years after eggs were introduced. DNA sequencing of microsatellite loci in parents and offspring were then used to determine the population of origin of 511 offspring sampled in Cherry Creek in 2008 and will ultimately be used for over 750 offspring sampled in 2007 and 2009. Preliminary results suggest that a colder common habitat produces larger differences in relative fitness than a warmer habitat.