

ABSTRACTS

BIOLOGICAL SCIENCES - AQUATIC ECOSYSTEMS

THERMAL TOLERANCE OF ARCTIC GRAYLING AND COMPARISONS WITH SUMMER WATER TEMPERATURES IN THE BIG HOLE RIVER ^{AFS}

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Among the factors potentially limiting abundance of Arctic grayling in the Big Hole River, Montana are warm mid-summer water temperatures. To assess affects of high temperatures on survival of Arctic grayling, we determined critical thermal maxima (CTM) and resistance times to a range of temperatures. We compared these parameters with water temperature records from the Big Hole River in years of drought and above-normal precipitation. Thermal tolerance increased with acclimation temperature. Highest mean CTM was 29.4 °C for fish acclimated to 20°C. Ultimate upper

incipient lethal temperature was estimated to be 25 °C. A group of Arctic grayling acclimated to 20 °C contracted parasitic and bacterial infections. Thermal tolerance of the diseased group was lower than uninfected fish acclimated at the same temperature. Comparisons of thermal tolerance parameters with thermograph records indicate that in drought years, such as 1992, Arctic grayling in the Big Hole River may be subjected to potentially lethal temperatures. In 1993, with higher than normal precipitation, water temperatures did not reach or exceed lethal limits.