
EFFECTS OF ELECTRICITY AND ALTERED CONDUCTIVITY ON RAINBOW TROUT EMBRYOS: A STUDY TO DETERMINE EFFICACY OF ELECTRICITY FOR ERADICATION OF INVASIVE SALMONIDS

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Electricity has been an applied means of facilitating capture and removal of invasive fishes for many years. Current methods involve use of electrodes to establish a current through which passing fish will be susceptible to a brief shock to stun. This method, however, only affects free swimming individuals and is not inclusive of early life history stages such as embryos within spawning substrate. This study evaluates the susceptibility of embryonic and larval stage rainbow trout (*Oncorhynchus mykiss*) to direct DC current between 2-20v/cm in varying conductive waters to determine lethality for invasive salmonid eradication efforts. Rainbow trout embryos ($n = 10$ embryos/exposure) were initially exposed to homogeneous electric fields for 5 sec with a water conductivity of 220uS/cm from 1 day post fertilization (DPF)/ 27 temperature units (TU) to 15 DPF/405TU. Mortality was assessed 24 hrs post exposure and the LV50 (lethal voltage) at 220uS/cm was determined for each TU. Embryos from six periods of development were then exposed to their respective LV50 voltages in varying conductive waters (20-600uS/cm). Susceptibility to direct DC voltages increased with voltage but overall susceptibility decreased with development. Susceptibility to a constant voltage increased with increasing conductivity and was consistent throughout early development (81TU-292TU), but the effects of increased conductivity were not enhanced in eyed embryos after 364TU. Results indicate that direct DC current applied prior to eyed embryonic stages, the period of greatest trout embryo susceptibility, is an effective means of eradicating invasive and nuisance salmonids