Fish Losses To Irrigation Diversions On Two Tributaries Of The Bitterroot River, Montana

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Withdrawals of surface water for irrigation and stock water leave the mainstem of the Bitterroot River and its tributaries chronically dewatered during the irrigation season. These water withdrawals affect local trout populations by entraining migratory trout in irrigation diversion canals at multiple life stages, and through the loss and degradation of available habitat for aquatic species. Irrigation losses may be responsible in part for the low abundances and restricted distributions of migratory native westslope cutthroat trout (*Oncorhynchus clarkii*) lewisi and bull trout (*Salvelinus confluentus*) in this system. Information about entrainment rates of fish into irrigation diversion canals and the factors that influence these rates is limited. Our goals were to quantify entrainment of fish into seven irrigation diversions on Lost Horse Creek and five irrigation diversions on Tin Cup Creek, two tributaries of the Bitterroot River, and to identify characteristics of these diversions that correlate with rates of entrainment. We sampled fish species by snorkeling, electrofishing, fry trapping, and reconnaissance at the end of the irrigation season at 60 sites in 2005 and 54 sites in 2006. In August, the period of peak abundances of entrained fish, we estimated 5525 fish in 2005 and 3372 fish in 2006 to be pres-ent in Lost Horse Creek diversions. We estimated 1904 fish in 2005 and 1158 fish in 2006 to be present in Tin Cup Creek diversions in August. The highest entrainment of fish occurred in canals diverting the greatest amounts of water.