An Assessment of Native Fish Losses to Irrigation Diversions on Lost Horse and tin Cup Creeks, Montana

Leslie Bahn and Alexander Zale, Montana State Cooperative Fishery Research Unit, P.O. Box 173460, Bozeman, MT 59717, lbahn@montana.edu

Christopher Clancy, Montana Fish, Wildlife and Parks, 1801 N. First St., Hamilton, MT 59840, cclancy@fs.fed.us

Mark Lere, Montana Fish, Wildlife and Parks, 1420 E. 6th Ave., Helena, MT, mlere@state.mt.us

Information about entrainment rates of fish into irrigation diversion canals in riverine systems and the factors that influence these rates is limited. Entrainment is especially prevalent among migratory native salmonid species, which can enter diversions as post-spawn adults migrating downstream or as juveniles emigrating from nursery tributaries. Such problems appear to be particularly common among westslope cutthroat trout (Oncorhynchus clarki lewisi) and bull trout (*Salvelinus confluentus*) populations in tributaries of the Bitterroot River, where irrigation losses may be responsible in part for low abundances and restricted distributions of these species. Our goals were to quantify entrainment rates of fish into all diversions on two tributaries of the Bitteroot River and to identify physical, spatial, and temporal characteristics of these diversions that correlate with rates of entrainment. We sampled fish species in 2005 by snorkeling, electrofishing, fry trapping, and reconnaissance at 60 sites located in irrigation diversions on Lost Horse and Tin Cup Creeks. A total of 9256 adult and juvenile fish in Lost Horse Creek diversions and 2819 adult and juvenile fish in Tin Cup Creek diversions were observed or captured. Preliminary analysis of our data indicates that the highest entrainment rates occurred in canals diverting the greatest amounts of water.