
SEASONAL FISH LOSSES THROUGH HAUSER DAM, MONTANA, 2007-2008

Justin P. Spinelli, Montana Cooperative Fishery Research Unit, Department of Ecology, Montana State University, P.O. Box 173460, Bozeman, Montana 59717-3460 spinelli@montana.edu

Alexander V. Zale, U.S. Geological Survey, Montana Cooperative Fishery Research Unit, Montana State University P.O. Box 173460, Bozeman, Montana 59717-3460 zale@usgs.gov

Management of fish populations in Hauser Reservoir, Montana, is hindered by undesirable and unpredictable downstream fish entrainment through Hauser Dam. We quantified fish entrainment through the dam using hydroacoustics at turbine intakes from July 2007 to November 2008 and over the spillway from 21 May to 18 July 2008. Species composition was characterized using multiple netting gears. Total estimated entrainment was $145,470 \pm 6,204$. Annual entrainment from summer to autumn was higher in 2007 ($n = 79,031 \pm 4378$) than in 2008 ($n = 52,513 \pm 3,966$). Spillway entrainment was 19 percent of annual entrainment in 2008 and was correlated with spillway discharge; turbine entrainment was not. Turbine entrainment increased from summer to autumn in both years, probably in response to autumn turnover and releases of hatchery rainbow trout (*Oncorhynchus mykiss*). Spill entrainment in 2008 resulted in similar entrainment between summer and autumn, but autumn turbine entrainment increased in 2008. About 60 percent of entrained fish were smaller than 220 mm. We applied species composition by size to the hydroacoustic data to identify fish species entrained, but many fish ($n = 55,529 \pm 4,397$) could not be reliably assigned to species because concurrent net catches did not include individuals of similar size. Total entrainment of identified fish was made up of mostly rainbow trout (*Oncorhynchus mykiss*; 33.3%) and

walleye (*Stizostedion vitreum*; 30.2%). Identification of patterns in spatial and temporal fish losses affords fishery managers the ability to make more informed decisions about operation of this dam.