

## SPATIAL AND TEMPORAL FISH ENTRAINMENT FROM HAUSER RESERVOIR, MONTANA

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Management sport fish populations of Hauser Reservoir, Montana, is hindered by undesirable and unpredictable downstream entrainment of fish through Hauser Dam. We quantified fish entrainment through Hauser Dam using hydroacoustic technology at turbine intakes from July 2007 to November 2008 and over the spillway from 21 May to 18 July 2008. Species composition of entrainment was characterized using multiple netting gears. Annual estimated turbine entrainment was higher in 2007 ( $N = 99,148 \pm 5582$ ) than in 2008 ( $N = 53,456 \pm 5,118$ ). Spillway entrainment ( $N = 29,931 \pm 3173$ ) was 36 percent of total annual entrainment in 2008. Entrainment was higher in fall than in summer in both years, likely in response to fall turnover and the annual release of hatchery rainbow trout. Most entrained fish ( $\sim 60\%$ ) were  $< 220$  mm total length in both turbine discharge and spill. The most common fish captured were rainbow trout (43%), white sucker (27%), and walleye (15%). The least common were common carp and yellow perch. We applied species composition by size to the hydroacoustic data to identify fish species entrained, but most fish ( $N = 74,062 \pm 4834$ ) could not be reliably assigned to a species because concurrent net catches did not include individuals of similar size. Most identified entrained fish were rainbow trout ( $N = 33,472 \pm 3014$ ) and walleye ( $N = 35,439 \pm 2953$ ). Identification of patterns in spatial and temporal fish losses affords fishery managers the ability to make more informed decisions about operation of this dam.