
BULL TROUT ENTRAINMENT AT LIBBY DAM IN THE KOOTENAI RIVER, MONTANA

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Montana Fish, Wildlife and Parks has used nighttime jetboat electrofishing to conduct annual mark-recapture population estimates of adult bull trout (*Salvelinus confluentus*) in the Libby Dam tailrace since 2004. Estimates are conducted during April or May within this 3.5-mi section of the Kootenai River, and have ranged from 176 bull trout in 2006 to 1079 bull trout in 2005. We collected tissue and scale samples from all bull trout we handled, and marked all fish with PIT tags, which allowed us to obtain capture histories across years for many fish. We recaptured 53 bull trout that were previously marked ranging between 285 to 1469 days prior. The recaptured bull trout grew an average of 101.4 mm (0.2 mm/day), and gained an average of 1869 g (3.1 g/day). Juvenile bull trout were collected from 15 tributaries within the Kootenai River Basin in British Columbia and Montana to develop a genetic methodology using microsatellite loci to assess whether fish originated above or below Libby Dam. Results indicated that there is a high degree of genetic variation among different bull trout populations within the Kootenai River basin. Jackknife analysis of our baseline data

set indicated that we had a high degree of power ($> 95\%$) to correctly assign unknown fish captured in the Kootenai River as originating either upstream or downstream of Libby Dam. We applied this methodology to the tissue and scale samples collected each year below Libby Dam during the population estimates to predict origin, and estimated that the proportion of the fish originating above Libby Dam ranged from 49.1 percent in 2004 to 62.7 percent in 2006. The majority of the adults assigned to populations above the dam were assigned to the Wigwam River, British Columbia, which represented the tributary with the highest number of bull trout redds in recent years.