**Entrainment vulnerability of bull trout and burbot at the Mica Dam (Kinbasket Reservoir, BC)**

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Abstract

Fish using habitats near hydropower dams are vulnerable to being non-volitionally displaced from reservoirs (i.e. entrained) when water is diverted through turbines for the generation of electricity. We are investigating entrainment rates and vulnerability of bull trout (*Salvelinus confluentus*) and burbot (*Lota lota*) in a large hydropower reservoir (Kinbasket Lake, Mica Dam) in the upper Columbia River, British Columbia. Bull trout (n = 192) and burbot (n = 50) were acoustically tagged in the spring of 2010 and monitored for one year with an array of receivers deployed in the forebay and tailrace of the Mica Dam. Three (1.6% of the total tagged) bull trout and one (2%) burbot were detected in the tailrace, indicating that they were entrained, and all of these detections occurred during the fall or winter months. We developed an entrainment vulnerability metric based on the percent time that a fish spends in the forebay per month (%FTM) and analyzed it as a function of fish size, sex, season, and tagging season (sex and tagging season for bull trout only). Our results indicated that %FTM was associated with season, with both bull trout and burbot spending on average about twice as much time in the forebay during winter and fall than during the spring and summer. This finding is consistent with the timing of fish detections in the tailrace. We are currently collecting one more year of data (to be downloaded in the spring of 2012) that will supplement our preliminary analysis. Furthermore, we started another telemetry study to investigate fine-scale movements of bull trout and burbot in the vicinity (within 200 m) of the Mica Dam powerhouse. The fine-scale movement data will be integrated with modeled intake-induced flow data and will help us understand how the fish behave in relation to the flow field. Collectively, the results of these studies will help develop operational guidelines to reduce adult bull trout and burbot entrainment risks.