Topic:
EFN and fisheries

Title:
Environmental Flow Needs (EFN) for SARA-listed Shorthead Sculpin in Norns Creek, Castlegar, BC.

Description:
Small scale water use for residential and commercial purposes has been identified as a threat to Shorthead Sculpin (*Cottus confusus*), a federally listed species at-risk (SARA), throughout its range (DFO 2007). A relatively abundant population is present in the lowest 2 km section of Norns Creek (Castlegar, BC). Considering that Shorthead Sculpin are restricted to this short habitat section, there may be a high level of risk to this population during times of significant water withdrawals. Regional fisheries management priorities indicate that there is a need to identify critical habitat requirements and EFN for at-risk species like Shorthead Sculpin. EFN is the quantity of water required in rivers to sustain an acceptable level of aquatic biota at various phases of development. However, determination of EFN requires an active hydrometric record, which is not available for Norns Creek. A two year hydrometric flow monitoring program (2016-2017) was completed and coupled with a regional flow analysis for Norns Creek. Hydrologically-based environmental flow methods (% Mean Annual Flow (MAF) and 7-day 10% annual probability low flow (7Q10)) as well as a simple habitat preference method (Weighted Useable Width) were compared to help determine EFN for Shorthead Sculpin and Rainbow Trout (*Oncorhynchus mykiss*), a locally important species with a significant population present in Norns Creek. It was recommended that 0.78 m^3/s (20% MAF) be maintained as a minimum annual EFN. Mean monthly discharge was typically higher than 20% MAF with the exception of the low flow months that were either at this discharge (September and October) or slightly lower (January or February). This suggests that if current flows and withdrawals are maintained, the EFN are likely to be met. However, the lowest point discharge observed during the study period was 0.2 m^3/s, <10% MAF, suggesting habitat conditions may be degraded at intermittent periods.

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