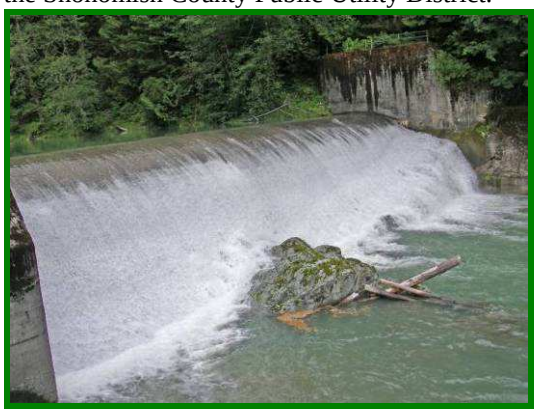
Sultan River Instream Flow Study

Henry M. Jackson Hydroelectric Project – Relicensing Studies

The Henry M. Jackson Hydroelectric Project (FERC # 2157) is located on the Sultan River, approximately 24 miles east of Everett, Washington, in south central Snohomish County, and is jointly owned by the City of Everett and the Snohomish County Public Utility District.



An instream flow study was requested during stakeholder consultations as part of the Federal Energy Regulatory Commission (FERC) Integrated Relicensing Process (ILP) for the Project. R2 Resource Consultants was selected conduct the study to identify the types and amounts of habitat potentially available under different flow conditions to fish species in three reaches of the Sultan River influenced by the Project operations.

The study focused on three operational reaches of the Sultan River that are regulated to varying degrees and amounts by Project-related operations. Six mainstem study sites, two sites within each of reach, were established on the Sultan River from Culmback Dam to the confluence with the Skykomish River. Three side channels located within Reach 1 were also evaluated during the study.

Project Elements:

- Instream Flow Surveys
- Anadromous Fish Production
- PHABSIM and hydrologic modeling
- FERC Relicensing

A PHABSIM-type analysis involving transect placement and measurement conducted in concert with the mainstem study was completed to address the flow-habitat quantity component; surveying of water surface and bed elevations at the inlets of each side channel was used to determine mainstem connectivity. Field data were collected at each transect under a series of five test flow releases. Output from the hydraulic simulation modeling was used in conjunction with modified and Fallback HSC criteria to simulate habitat conditions for selected target fish species including Chinook, coho, pink, and chum salmon, as well as steelhead, sea-run cutthroat, resident rainbow, and cutthroat trout.

The study resulted in the development of a series of habitat-flow relationships for each operational reach of the mainstem Sultan River, and the three side channels in the lower reach (Reach 1). The study also defined the relationship of mainstem flow to side channel flow and determined the amount of surface areas available in each. In addition, time series and habitat duration analyses estimated the amounts of habitat for a given species and life stage that would occur under two different operational conditions for three different water year types.

The information provided from this study was useful for evaluating tradeoffs relative to gains in habitat versus changes in flow both on a reach scale basis as well as for the overall system.