



PROJECT DESCRIPTION

During the re-licensing procedure for the Hells Canyon Dam (HCD), the US Forest Service demanded mitigation to a number of small, environmentally-sensitive sand-bars on Hells Canyon National Recreation Area (HCNRA) of the Snake River for damage caused by Idaho Power's operations. Idaho Power contended that some portion of the damage was due to the actions of jet-powered tour boats that operate on the river. This three-phased study assessed the relative impacts of powerboat and hydropower operation on sand bar erosion and spawning beds.

PROJECT APPROACH

The first phase of the study, primarily a field investigation and desk study, showed that boat wakes can be a potential controlling factor in sediment transport on the sand and gravel bars in the HCNRA. This finding led to the development of the two subsequent modelling-focused studies.

The second phase focused on hydrodynamics and involved the application of Coldwater's LSV model to assess the relative impacts of the HCD and tour boat operation. Coldwater prepared realistic seasonal test scenarios of dam discharge, boat scheduling, etc. The LSV model was applied to selected scenarios and results were compared to hydropower-only operations to assess relative impacts.

The third phase focused on fine-scale sediment behaviour. This work was based on an observation from the field work that fine sediment suspended by a wake event was carried offshore into deeper water by a small undertow current. Using the vertical structure of wave undertow currents as a forcing mechanism, Coldwater's PTM model was used to study this phenomenon. The predictions of suspended sediment concentration with time were found to match field data closely in both magnitude and pattern. Animations of the results illustrated how repeated passes by jet tour boats led to a slow, gradual offshore migration of sediments from the beach to deeper water in the river. From here, the sediments were carried downstream away from the sand bars during nightly peak dam operations. After being presented with the study results, the US Forest Service accepted that Idaho Power was not fully responsible for impacts and withdrew their objections to the re-licensing.

CLIENT

Davis Wright Tremaine LLP
Washington, DC
on behalf of Idaho Power

LOCATION

Snake River

DATE

2005-2006