Abstracts - Dissolved Oxygen Monitoring and Substrate Quality

Nechako River Substrate Quality and Composition (M89-7)
Prepared by Ken Rood, Ken Rood & Associates, June 1998

Substrate quality, often measured as the proportion of fine sediments in stream gravels, is associated with spawning success, incubation success, rearing habitat quality and invertebrate production. Fine sediments are particularly detrimental to successful salmonid reproduction. Numerous laboratory and field studies have described inverse relationships between the proportion of fines (above some critical level) and egg survival or fry emergence. It is generally assumed that increased mortality is caused by lower intragravel velocities, lower permeabilities, lower dissolved oxygen and entombment of eggs, alevins and fry by fine sediments.
ivIn regulated rivers it is often assumed that substrate quality deteriorates following regulation (Reiser et al. 1985). Typically, regulation reduces peak flows, lowering sediment transport capacity for gravel and larger particles. Lack of gravel movement, or bed immobility, is associated with accumulation of fine sediments and deterioration of substrate quality. The Nechako Fisheries Conservation Program (NFCP) Technical Committee is responsible for monitoring gravel quality along the Nechako River. This committee, through the Department of Fisheries and Oceans, has contracted with K. Rood & Associates to develop a substrate quality sampling project for the Nechako River. This was accomplished by:

Reviewing substrate sampling methodologies, discussing the advantages and disadvantages of each method;

Summarizing existing data on substrate quality and composition in the Nechako River;

Conducting a one-day expert workshop to review appropriate gravel quality sampling projects;

Summarizing results of the workshop and developing an appropriate sampling strategy for the Nechako River; and

Completing a pilot sampling project for gravel quality along the Nechako River, analysing the samples and presenting the results.

A background report reviewing substrate sampling techniques was circulated to workshop participants prior to the meeting on August 1, 1989. Material from the background report was incorporated into this report which critically reviews substrate sampling methodologies, summarizes the existing database on the Nechako River, summarizes workshop discussions, recommends a sampling strategy for substrate quality and presents the results of a pilot sampling on the Nechako River.