Report of Telecon between Bill Hauser, July 24, 2007 with Doug Lofthouse, Assessment Biologist, and Ken Woo, Senior Engineer, Fisheries and Oceans, Canada, Oceans, Habitat and Enhancement, 200 - 401 Burrard St, Vancouver, BC V6C 3S4 (telecon record was reviewed and approved by Ken Woo)

Subject: Operation and effectiveness of salmon spawning channels in British Columbia

There are two basic types of spawning channels; groundwater-fed spawning channels are typically smaller-scale and mimic upwelling groundwater spawning habitat. These channels favour chum spawning, but sometimes, coho are secondary benefactors. Marshall and Finnegan were leading developers of groundwater-fed channels. Surface-flow spawning channels are larger in scale and mimic typical natural stream spawning habitat. These channels are operated mainly for sockeye salmon spawning, although chum and pink channels do exist. Woo and Lofthouse are more familiar with the surface-flow types of channels. Woo and Lofthouse are not aware of any spawning channel that has proven successful for Chinook salmon (attempted in late sixties on Vancouver Island and more recently on the lower Columbia).

Regardless of the type of channel, the key to success depends on the careful definition of the purpose for the channel, the site selection process, the water supply, and staffing/maintenance requirements. Design and construction are also important. The measure of success is not the numbers of adults loaded into the site or egg to fry survival, but the contribution of channel origin fish to future catch and escapement.

A sockeye salmon spawning channel may be constructed to replace lost spawning habitat or to create new spawning habitat, but in any instance, additional spawning habitat will be of no value unless underutilized rearing habitat is available for the fry that are produced. Stock selection/matching must also be considered.

Survival rates from egg to fry in some channels may be as high as 70 to 80%, but there is great variability between channels. The channels with the best performance are those with the cleanest water supply (e.g., lake fed rather than stream fed so siltation from freshets and floods can be avoided), best temperature control (e.g., with more than one intake so optimal incubation temperature can be maintained) and with full-time, dedicated staff. Annual cleaning and destratification (mixing) of the gravels may be required. Unattended and unmonitored channels will not last. Groundwater spawning channels require less maintenance and staffing than surface water channels.

The last surface water channel, of about 25, was constructed in 1989, however, the vast majority are still operational. Past benefit/cost analyses have been favourable and a new analysis for the entire enhancement program is scheduled soon.

Ken Woo sent a spreadsheet (that has not been updated recently) that lists physical, biological and maintenance details for surface water channels that have been built between 1954 and 1990.

Published information has been meagre, but two important publications include:
McDonald, J. and J. Hume. 1984. Babine Lake sockeye salmon (Oncorhynchus nerka) enhancement program: testing some major assumptions. Can. J. Fish. Aquat. Sci. 41: 70-92.

“While the assumptions regarding juvenile production were found to be generally valid, adult returns did not met expectations… due largely to lack of response to increased smolt outputs from even-numbered brood years.”

Sockeye salmon (Oncorhynchus nerka) : population biology and future management : proceedings of the International Sockeye Salmon Symposium - Sockeye '85, held at Nanaimo, British Columbia, November 19-22, 1985 / edited by H.D. Smith, L. Margolis, and C.C. Wood.
Publisher:
Ottawa : Dept. of Fisheries and Oceans, 1987.
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Sockeye salmon--Congresses.
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Library	Location	Call Number	Material	Status
ARLIS	General Collection	SH167.S17I58 1985	Book	Available
UAA/APU Consortium	General Collection	SH346.S65 1987	Book	Available

This symposium includes a benefit-cost analysis by C. West and J. Mason.