



February 27, 2007

**CHEAKAMUS RIVER STEELHEAD
FISH CULTURE PROGRAM
February 2007 Update**

Following a spill of sodium hydroxide (NaOH) into the Cheakamus River a two year fish culture program for steelhead trout was initiated by the Ministry of Environment (MoE) in conjunction with the Freshwater Fisheries Society of BC (FFSBC), and Fisheries and Oceans Canada.

The objective of the CN funded steelhead program is to release 20,000 smolts in 2007 and 2008 to supplement the wild adult returns in 2009 and 2010. The fish will not be subject to harvest but allowed to spawn. The steelhead culture program is will be closely monitored to try and determine effectiveness, and the MoE will be monitoring the recovery to completion.

Instream Fisheries Research Inc. have been hired by MoE to help coordinate and implement the fish culture monitoring program. They have extensive experience with steelhead supplementation program evaluations, stock assessment, and have been actively conducting fisheries work on the Cheakamus River for 8 years.

Previous program updates have reported on Year 1 broodstock capture success, spawning methods and mating structure, rearing locations and smolt targets (November 2006). This update covers Year 1 juvenile rearing and Year 2 brood collection,

Rearing Update

In order to meet established smolt size goals (80 grams by May 2007) growth of the fish destined for rearing at Tenderfoot Creek Hatchery (TCH) was accelerated on 14 degree C water throughout their stay at Fraser Valley Trout Hatchery (FVTH). The plan was to transfer these fish to TCH in mid to late October. Due to a minor bacteria infection outbreak of internal myxobacteria (Flavo-bacterium), transfer of the fish to TCH was delayed until these fish were treated with anti-biotics and re-examined by a Fish Health Biologist to ensure the fish were healthy and safe for transfer. Approval was given

in early December ~11,000 fish were transferred to TCH in mid/late December, and another 11,000 remain at FVTH.

The fish are rearing well at both facilities. A feeding regime including dried krill has been implemented at TCH in an effort to encourage faster growth as some of these fish are as yet below target weight for this stage of rearing.

Fish Marking

All fish were marked in early November with an adipose clip. In addition, the fish rearing at FVTH were also implanted with a coded wire tag. These microscopic magnetic tags were inserted into the bony structure of the fish's head (<http://www.nmt.us/>) and will allow for screening of fish on return for rearing origin (TCH or FVTH), as part of program effectiveness monitoring.

Surplus Fish

The by-product of producing the best possible 20,000 smolts is excess fish. In addition to the ~22,000 smolts rearing at the two facilities, approximately 12,500 fish were surplus to the needs of the smolt program. The ministry has been considering the option of stocking the remainder into one or several lakes where they will not impact wild fish, but will contribute to a local fishery. Of this, ~6,000 fish were released into Mill Lake (partially to alleviate rearing density concerns), the remaining ~6,000 fish are being held pending plans for stocking within the Howe Sound watershed (Cat or Loggers lakes), possibly in conjunction with a temporary lake fertilization program to increase fish size and survival. Stocking will occur when water temperatures increase.

Broodstock Collection Protocol for 2007

The collection of suitable broodstock is a key element in the success of any conservation hatchery supplementation program. In principle, selection of fish for broodstock (genetic material) which represent the target population is the goal, while avoiding the risk of selecting individuals destined to be from one life history strategy, for example, skewed to early return, or smaller fish. This may be achieved by selecting individuals from a range of sizes over a period of several weeks or months, and from different geographic locations. This should ensure broodstock encompass different adult return strategies and theoretically a broad genetic diversity.

In the case of the Cheakamus River, broodstock can be adequately collected through angling and various age classes of fish represented through selection of a variety of sizes of fish. As Brohm Creek spawners appear to exhibit a return strategy somewhat different from other Cheakamus River steelhead (early run, smaller fish, with low repeat spawner frequency), selection of these is to be avoided where possible. This potential sub-stock was largely unaffected by the 2005 spill and is thus likely to be present in numbers sufficient to seed the Brohm Creek to capacity even in affected years. If Brohm Creek adults were used for broodstock they may not migrate sufficiently far up the

Cheakamus to seed the upper river area on return and are perhaps maladapted for spawning and rearing in lower river conditions.

Based on 5 years of radio telemetry observations a draft broodstock collection protocol has been developed for the collection of 10 pairs of broodstock. The following guidelines are proposed to ensure a broad variety of fish (genetic material) are captured, while reducing the risk of magnification of Brohm Creek genetics in the hatchery produced smolts. Brood collection is scheduled to begin in early-March, and as per last year will be coordinated through FFSBC and TCH staff.

Protocol 1: Fish above 750mm in length should represent >70% of the total broodstock collection to avoid selecting Brohm Creek and over selection of lower river spawners.

Note: Targeting some fish larger than 900mm would increase the chances of selecting upper river spawners

Protocol 2: Fish captures should be targeted after March 1st to reduce the probability of Brohm Creek fish being introduced to the broodstock.

Note: Captures post March 15th will favor the capture of upper river spawners which may form a discrete genetic population.

Protocol 3: Fish for brood stock collection should be captured above the confluence with the Cheekye River

Note: A buffer zone to Moodys side-channel could be implemented to avoid handling Brohm Creek fish which spend considerable time resident in the pool above the Cheekye River confluence.

A strategy for the 2007 smolt release is currently in development, and will be the subject of the next update letter.

Regular program updates will continue to be provided to the Cheakamus Recovery committees, and the public.

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