

## **Abstracts - Fry Emergence**

### **1990 Fry Emergence (M89-6)**

**Prepared by Triton Environmental Consultants Ltd. March 1996**

A chinook (*Oncorhynchus tshawytscha*) fry emergence trapping project on the Nechako River was initiated in 1990 to establish baseline information, and to develop an index to assist in the monitoring of the quality of the incubation environment after long term flows are established. Flows will be in accordance with the 1987 Settlement Agreement. A series of forced spills from the Nechako Reservoir in April 1990 probably confounded emergence. Since this was the initial year of the project it was not possible to assess the effect that the increased flows may have had on fry emergence patterns and behaviour. Four Inclined Plane Traps (IPT) were installed at kilometer 19 of the Nechako River (Bert Irvine's Lodge) and captured emergent fry from March 17 to April 30, 1990. The peak spawning period of 1989 was September 14 and 50% emergence occurred by April 5, 1990 (935.0 Accumulated Thermal Units (ATU)). Emergence appeared to have followed a bimodal pattern. Fry emergence within the study area was estimated as a weighted average of 638,120 from the four inclined plane traps. Emergence success, based on the spawner population determined from both the area under the curve (AUC) method and the proportion of the spawning population within the study area, averaged 45%.

### **1991 Fry Emergence (M90-6)**

**Prepared by Triton Environmental Consultants Ltd. March 1996**

The 1991 chinook (*Oncorhynchus tshawytscha*) fry emergence trapping project on the Nechako River was carried out to establish baseline information, and to develop an index of fry emergence to assist in the monitoring of the quality of the incubation environment after long term flows are established in accordance with the 1987 Settlement Agreement. Four inclined plane traps (IPTs) were installed at km 19 of the Nechako River (Bert Irvine's Lodge) and captured emergent fry from March 7 to May 22, 1991. The peak spawning period of 1990 was September 12 and the 50% mean emergence was estimated to have occurred April 24, 1991 (835 Accumulated Thermal Units (ATUs)). Emergence appeared to have followed a bi-modal pattern. The index of fry emergence within the study area was estimated at 589,456 and the emergence success at 42%.

### **1992 Fry Emergence (M91-6)**

**Prepared by Triton Environmental Consultants Ltd. March 1996**

The fry emergence trapping project was conducted in Reach 2 of the Nechako River for the third consecutive year. This was the first year in which no forced spill occurred during emergence, and it thus provides valuable baseline data for assessing the effects of future water releases. Four inclined plane traps (IPTs) sampled the emerging fry population from March 8 to May 13, 1992. Temperature and flow rate were recorded each day, and subsamples of the daily chinook catches were measured and weighed. An index of fry emergence was calculated from the proportion of the flow sampled by the IPTs and from mark-recapture trials. Approximately 512,000 chinook fry, accounting for an emergence success of 47.5%, were estimated to have hatched in the Nechako in 1992, as compared to 589,000 in 1991. The emergence peaked around April 20, which is comparable to the previous year. Fry emerging in 1992 were of an average size similar to those emerging in 1991, and the slopes of fry fork length, wet weight and development index in function of date of emergence were all positive, indicating an increase, albeit extremely small, of these parameters over time.

### **1993 Fry Emergence (M92-6)**

**Prepared by Triton Environmental Consultants Ltd. March 1996**

The fry emergence trapping project was conducted on Reach 2 of the Nechako River for the fourth consecutive year. This was the second year in which no forced spill occurred during emergence, and it thus adds significantly to the baseline database for assessing the effects of future water releases. Four inclined plane traps (IPTs) sampled the emerging fry population from March 15 to May 20, 1993. Temperature and flow rate were recorded each day, and subsamples of the daily chinook catches were measured and weighed. An index of fry emergence was calculated from the proportion of the flow sampled by the IPTs and from mark-recapture trials. Approximately 277,000 chinook fry, accounting for an emergence success of 43%, were estimated to have hatched in Reach 1 and the upper Reach 2 of the Nechako River in 1993, as compared to 512,000 in 1992. The emergence peaked around April 22, which is comparable to the previous year. Fry emerging in 1993 were of an average size similar to those emerging in 1992. The regressions of fry size versus time yielded positive slopes for fork length and wet weight, and negative slopes for development indices.

### **1994 Fry Emergence (M93-6)**

**Prepared by Triton Environmental Consultants Ltd. March 1996**

The fry emergence trapping project was conducted on Reach 2 of the Nechako River for the fifth consecutive year. This was the third year in which no forced spill occurred during emergence, and it thus adds significantly to the baseline database for assessing the effects of future water releases. Four inclined plane traps (IPTs) sampled the emerging fry population from March 7 to May 20, 1994. Temperature and flow rate were recorded each day, and subsamples of the daily chinook catches were measured and weighed. An index of fry

emergence was calculated from the proportion of the flow sampled by the IPTs and from mark-recapture trials. The index of fry emergence for Reach 1 and the upper portion of Reach 2 of the Nechako River in 1994 was estimated at approximately 95,000 chinook fry, as compared to approximately 277,000 in 1993. The emergence peaked around April 18, which is comparable (four days earlier) to the previous year. Fry caught in the margin traps were slightly longer than fry caught in the midstream traps, and their development index was lower. The index of emergence success was estimated at 43.5%. Fry emerging in 1994 were of an average size similar to those emerging in the previous years of the program.

### **1996 Fry Emergence (M95-6)**

**Prepared by Triton Environmental Consultants Ltd. September 1999**

As a component of the Early Warning Monitoring Program for the Nechako Fisheries Conservation Program, the fry emergence trapping project was conducted on Reach 2 of the Nechako River for the seventh consecutive year. Four Inclined Plane Traps (IPTs) sampled the emerging fry population from March 12 to May 22, 1996. Temperature and flow rate were recorded each day, and subsamples of the daily chinook catches were measured and weighed. The median date of emergence (when 50% of the fry had emerged) occurred on May 6, 1996, the latest date recorded since the inception of the program. The reason for the later emergence is likely due to colder than usual incubation/in ground rearing conditions during the preceding winter. The total emerging fry population was estimated from the proportion of the flow sampled by the IPTs and from mark-recapture trials. Approximately 428,000 chinook fry, equivalent to an emergence success of 49%, were estimated to have hatched in Reach 1 and upper Reach 2 of the Nechako River in 1996, as compared to 242,000 in 1995 (emergence success of 57%). There were two peaks of emergence, one centered around April 12, and another one centered around May 11. For comparison, the emergence peaked around April 30 in the previous year (1995). Fry caught in one of the margin traps (IPT 1) were statistically longer and heavier than fry caught in the other traps, although the biological significance of this result is debatable. There were significantly more fry emerging at night, and they were smaller and lighter than fry emerging during the day. This observation is consistent with those of previous years. The average size of fry emerging in 1996 was comparable to the average size of those emerging in the previous years of the project. The regressions of fry size vs. time yielded positive, albeit very small, slopes, indicating that fry emerging in May might be slightly larger than those emerging in March.