Monitoring Spawning Rainbow Trout and Redd Counts in the Slocan River: 2003 – 2006

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1.0 Introduction

The Slocan Rivers Streamkeepers have begun long term monitoring of a variety of environmental and biological variables in the river to serve as a baseline from which to monitor ecological change. We identified spawning productivity of rainbow trout (*Oncorhynchus mykiss*) as a reasonable measurement of ecosystem health and therefore a valuable biological variable to monitor over time. The intent of this survey is to collect data for comparison from year to year at the same location (relative abundance) versus determining total productivity through out the river.

The majority of rainbow trout in the Slocan River spawn in the mainstem of the river below the outlet of Slocan Lake (Baxter and Roome, 1998). Spawning is reasonably concentrated both in timing and geographic position with a bridge crossing over primary spawning habitat. These conditions offer a reasonably efficient opportunity to enumerate spawning fish and redds in the Slocan River.

This is the forth year of monitoring. Based on our early objectives and subsequent results over the years, we have modified the methodology to make it more efficient while maintaining the quality of data collected (Corbett, 2005).

2.0 Methods

In the past, we have used fixed plot at the gravel pit bridge site to count both fish and redds observed throughout the spawning season. It was determined that this was ineffective because 1) the number of fish vary throughout the spawning season and is therefore unreliable as a measure of reproductive production and 2) the bridge was acting as an artifact and influencing spawning use and results did not correlate to the index site redd counts. For these reasons, we are now only using the snorkel float counts of the index site to enumerate redds in the study area.

This method employs snorkel float counts conducted between the first and second bridges (spawning index site). We used 6 counting lanes, stratified by shore, near-shore and mid channel zones for both of the right and left sides of the river, one diver per lane. All fish observed were tallied as well as each redd. The floats were conducted at the conclusion of the spawning season to be sure all redds for that year were enumerated.

3.0 Results

Snorkel float counts were conducted on April 18th and 24th. The initial float was to determine how far along the spawning season had progressed as there appears to be some variation between years based on the environmental factors that influence rainbow trout spawning. Subsequently, the count on the 24th, represents the final tally. The number of redds in 2006 was the highest total count observed in the four years of monitoring (see figure 1).

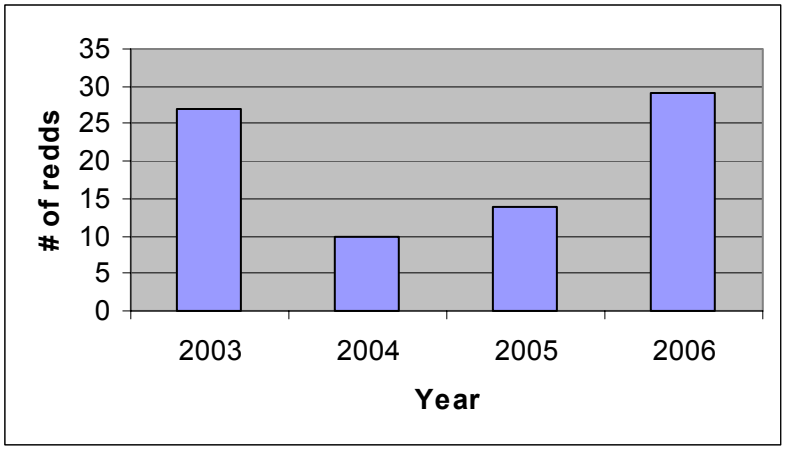

Figure 1. The number of rainbow trout redds observed on April 24th, 2006 at the Slocan River spawning index site.

4.0 Discussion

In order to determine trends in populations, it is critical that the data collected is reliable, repeatable and collected over a long period of time. It is also important to collect other biological and environmental data over the same periods in time to assist in the interpretation of these perceived trends. In conjunction with this study, we are also monitoring water temperature, air temperature, turbidity, water levels and velocity as well as population densities and demographics of the benthic community throughout the Slocan River watershed. In addition, a rainbow trout population assessment was completed in 2005 (Corbett, 2006).

In 2004, there was a sharp decline in the number of spawning trout and their associated redds. This decline appears to correspond with the extreme water temperatures experienced during the summer of 2003 and continuing to persist somewhat in 2004. Long periods of exposure to lethal temperatures is known to cause adult fish kills in rainbow trout and is likely what is reflected in this data. Since this decline, the number of redds observed has continued to climb and in 2006, the number of redds surpassed our previous high.

The trout that were the product of the 2003 spawning season would be of spawning age in 2006 and likely represent a large portion of the redds observed in 2006. The trout that were produced in the low productive year of 2004 would be trout in the 10-20 cm fork-length class observed in the population assessment conducted in 2005. This age class appears to be under represented in the 2005 assessment (Corbett, 2006) based on previously observed age class structures for rainbow trout populations in the Slocan River (Oliver, 2001). This would appear to strengthen the theory that the trout population in the Slocan River is regulated by water temperature, whereby in years of extreme water temperature, juvenile mortality or reduced fitness occurs, forcing the population through a bottleneck and causing a high degree of variability in the adult trout population from year to year.

These speculations should still be considered with caution, as there are many other variables, both biological and physical, that may influence the rainbow trout population in the Slocan River.

5.0 Literature Cited.

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