

JUVENILE STEELHEAD SURVEYS
IN THE KITWANGA, MORICE, AND
ZYMOETZ RIVERS, 1993

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1.0 INTRODUCTION

For the third consecutive year juvenile steelhead fry and parr abundance surveys were conducted on three Skeena River tributaries: the Kitwanga, Zymoetz (Copper) and Morice rivers (Figure 1).

The objectives of this study were:

- i. To conduct quantitative estimates of juvenile steelhead fry, and, to a lesser extent, parr abundance at a network of index sites throughout the Kitwanga, Morice and Zymoetz river watersheds.
- ii. To compare these estimates to those obtained in 1991 and 1992.

Detailed site descriptions, including photographs and/or sketches, habitat information and incidental catches of species other than steelhead are recorded in a separate appendix volume.

2.0 METHODS

These surveys were carried out by B.C. Environment staff between August 16, and September 23, 1993.

The methodology used was identical to that of the previous two years of study (Bustard, 1991, 1992) except that we used rocks to hold the lead line of our stopnets to the substrate rather than rebar. We sampled the exact same sites wherever possible (for site; in a few instances site locations were modified slightly due to different water levels and changes in stream morphology. Weights were taken on only a small number of fish as this aspect of the project was not considered to be a high priority given the limited availability of staff time.

3.0 RESULTS

Between August 16 and September 23, 1993, B.C. Environment staff electrofished forty sites to obtain juvenile steelhead density estimates. We surveyed seven sites on the Kitwanga River, thirteen on the Zymoetz River and twenty on the Morice River. Tables 1, 2 and 3 show juvenile density estimates for steelhead fry and parr for the last three years. Appendices 1-3 show site dimensions and calculations of fry and parr densities while Appendices 4-6 describe survey sites sampled in 1991-1993 listing access and dates surveyed.

3.1 Kitwanga River

Statistical analysis (paired-sample t test, 95% confidence level) of the Kitwanga River data failed to demonstrate any significant differences between 1991, 1992 and 1993 parr densities. Similarly there were no major differences noted when comparing fry data in 1992 and 1993. A significant variation in fry densities was seen when comparing 1991 and 1992 data; in 1993 we found fry densities were on average less than half of those observed in 1991.

In general, 1993 fry densities in the Kitwanga were greater than in 1992, yet less than in 1991 and parr densities this year were less than in 1991 and 1992.

We were unable to duplicate the exact location of site K7, reach 5, as was sampled the previous two years. The alternative site chosen was upstream in the vicinity of the lake outlet and failed to produce steelhead juveniles.

3.2 Morice River

Statistical analysis of mainstem Morice River data failed to show any major differences between fry or parr densities between the last three years. However, most Morice River tributaries showed a significant decline in parr densities.

In the mainstem Morice River the general trend for fry densities was an increase over both 1991 and 1992. The general trend for all tributaries sampled was a gradual to sharp decline in parr numbers. It must be noted that only one to two sites were investigated for each tributary.

3.3 Zymoetz River

Analysis of the Zymoetz River data failed to show any significant difference between the last three years of fry sampling. Significant differences in parr densities were detected when comparing 1991 and 1993 data in reach 6, the stretch of the Zymoetz between the Clore River and Red Canyon Creek. The 1993 densities were on average half of those observed in 1991. We also noted large differences in parr densities in reach 7, the section of the Zymoetz between Red Canyon Creek and the Serb River. This disparity was noted when comparing 1992 and 1993 data; on average we noted only one quarter of 1992 parr densities in 1993 for sites in this section of river.

In general, fry densities in the Zymoetz River were greater this year than in 1992, yet less than in 1991. Parr densities in 1993 were on average less than in 1992; 1991 parr densities were greater than 1993 yet less than 1992.

4.0 DISCUSSION AND RECOMMENDATIONS

We chose identical sites to those surveyed by Bustard (1993) where possible. Where water conditions would not allow this, we selected sites with similar water conditions (flow, depth). Bustard (1992, 1993) developed a set of criteria for classifying juvenile steelhead habitat suitability on the basis of water velocity, depth and substrate size. However, these parameters were generally assessed through visual estimation. In the future it is recommended that these criteria are measured and juvenile densities adjusted to reflect the specific habitat surveyed.

To increase the accuracy of this study it is also recommended that the number of sample sites and location of sites within each sample reach be reviewed. With the understanding that available manpower will limit the number of sites surveyed, care must be taken to ensure that effort is utilized most efficiently through stratification. In this years' investigations care was taken to attempt to duplicate both sample location and timing in an attempt to lengthen the data series.

It is interesting to note that the Tyee Test Fishery data (Figure 2) appear to coincide well with the results of the last three years of juvenile investigations. Mean fry densities in the Kitwanga, Morice and Zymoetz rivers were greatest in 1991 followed by 1993 and finally 1992. Adult return data as estimated by the test fishery show the same trend for the brood years 1990, 1991 and 1992. This

result is what would be expected had the test index produced stock specific estimates. The general watershed wide trend appears to qualitatively hold true for the tributary streams and sites we investigated.

5.0 REFERENCES

Bustard, D.R. 1992. Juvenile steelhead surveys in the Kitwanga, Morice, Sustut, and Zymoetz rivers, 1991. Man. Report prepared for B.C. Environment, Smithers.

Bustard, D.R. 1993. Juvenile steelhead surveys in the Kitwanga, Morice, Sustut and Zymoetz rivers, 1992. Man. Report prepared for B.C. Environment, Smithers.

6.0 APPENDICES

Appendices 1-3: Site dimensions and calculations of fry and parr densities.

Appendices 4-6: Survey sites sampled in 1991-1993 listing access and dates surveyed.