Alberta Conservation Association
2007/08 Project Summary Report

Project name: *Lotic Protocol Development*

Project leader: Kevin Fitzsimmons

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Partnerships:

Alberta Sustainable Resource Development

Key findings

- Stream order is an effective surrogate measure for mean stream wetted width in east slope stream orders 3 to 6.
- A 250-m reach length is likely adequate when estimating brook trout and bull trout abundance and spatial distribution using backpack electrofishing gear in wadeable streams.
- Variability in estimates of brook trout abundance and spatial distribution changed little when sampling intensity was reduced by 50%; variability in bull trout abundance was high regardless of sampling intensity.

Introduction

A primary goal of monitoring stream ecosystems is to assess fish species presence and abundance at monitoring sites. Given our limited budgets and resources, we need to develop sampling designs that collect accurate and unbiased data while minimizing costs. Maximizing our sampling efficiency through improvements in sampling protocols allows for more efficient allocation of resources. Following a review of current practice in Alberta, it was clear no standard or set of standards exists for the province for determining reach length when monitoring fish abundance (K. Fitzsimmons, unpublished data). The goal of this project was to evaluate the Alberta Conservation Association's current practices with respect to determining reach length for backpack electrofishing sites in wadeable streams and provide recommendations for determining an appropriate reach length when estimating trout abundance.

Methods

We evaluated the appropriateness of using stream order as a surrogate for mean stream width, a useful metric for determining sample reach length, by comparing stream order and wetted width measurements from four East Slopes watersheds. To assess sample reach length, we compared

backpack electrofishing catch data of brook trout and bull trout collected in 50-m increments, from a systematic sample of 500-m long reaches in the Waiparous Creek drainage.

Results

Our results indicate that stream order can be used as a surrogate for mean stream width for orders 3 to 6 streams but not for orders 1 and 2 streams. This result is significant as stream order is readily obtained from file or archival data while mean stream width information typically needs to be measured in the field. By analyzing the variation in models of spatial distribution and abundance of brook trout and bull trout (see Figure 1 for example), we also determined that a 250-m reach length is adequate for estimating abundance for these two species when using electrofishing gear in wadeable streams. Of particular interest was our observation that reducing sampling intensity by as much as 50% had very little impact on our brook trout estimates, while even full sampling intensity did little to resolve bull trout estimates.

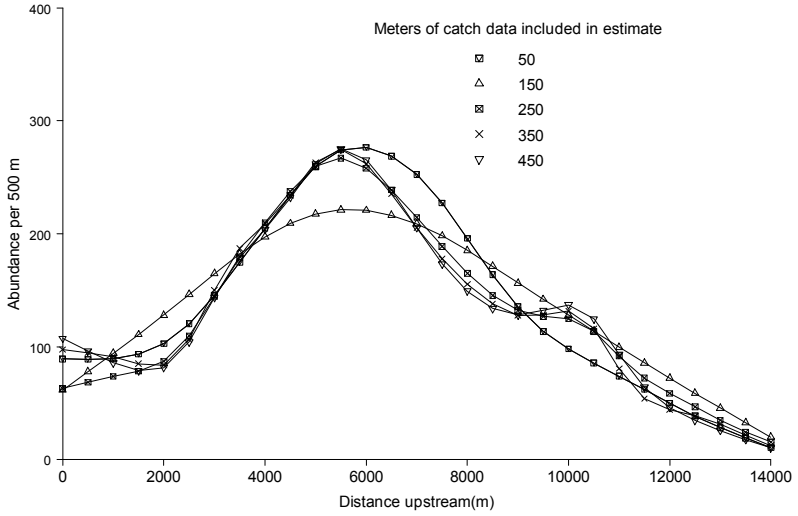

Figure 1. Variation in estimates of brook trout spatial distribution and abundance in Johnson Creek (Waiparous Creek drainage). Estimates were generated using incremental backpack electrofishing catch data from the first 50 m of each study reach up to 500 m, in 50-m increments.

Conclusion

By analyzing existing datasets, we were able to assess the validity of some commonly held assumptions with regards to determining reach length when assessing trout abundance using backpack electrofishing gear. Recommendations arising from this project will help us design more efficient studies in the future, while not compromising precision.

Communications

- Results summarized in a report that will be presented to the Alberta fisheries community, including the Provincial Fisheries Standards Committee.