

## ABSTRACT

### VARIATION IN TROUT GROWTH AND SURVIVAL WITHIN AND AMONG SEASONS, SPECIES AND COHORTS

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Data on the fine-scale seasonal variation in the growth and survival of salmonids is lacking. A natural extension of the current knowledge on the growth and survival of salmonids, therefore, is to sample a given population multiple times within a particular year. This will allow for growth rate and estimates of survival to be partitioned into finer scale intervals. I provide empirical data from a wild population of brook trout and brown trout to address the seasonal variation in their growth and survival. I found that growth rates were highest for both the 1999 and 2000 cohorts of brook and brown trout during their age-1+ spring. In addition, differences in growth rate emerged between the two cohorts of a given species during this period of rapid spring growth with the growth of the younger (age-1+) cohort exceeding that of the older (age-2+) cohort. Species differences also emerged seasonally, with the growth rates of brown trout, of both cohorts, exceeding the growth rates of equal-aged brook trout in nearly half of the intervals investigated. Estimated apparent survival of the brook trout 1999 cohort and the 1999 and 2000 cohorts of brown trout varied with time. Survival for all three of the aforementioned cohorts was higher in the summer than in the winter. Winter survival was higher for age-0+ brook trout (0.79) than for age-1+ brook trout (0.28). Winter survival differed little between age-0+ (0.62) and age-1+ (0.61) brown trout. The general trend of lower survival in the fall and winter relative to the spring was evident for brook and brown trout of the 1999 cohort. However, estimated apparent survival of brown trout from the 1999 cohort exceeded that of equal-aged brook trout in seven of the ten intervals examined. Brown trout of the 2000 cohort had higher apparent survival than equal-aged brook trout in three of the seven intervals examined.

#### **Publications:**

Carlson, S. M., A. P. Hendry, and B. H. Letcher. 2007. Growth rate differences between resident native brook trout and non-native brown trout. *Journal of Fish Biology* 71: 1430-1447.

Carlson, S. M., A. P. Hendry, and B. H. Letcher. 2004. Natural selection acting on body size, growth rate and compensatory growth: an empirical test in a wild trout population. *Evolutionary Ecology Research* 6(7): 955-973.

Carlson, S. M. and B. H. Letcher. 2003. Variation in brook and brown trout survival within and among seasons, species, and age classes. *Journal of Fish Biology* 63(3): 780-794.