

## ABSTRACT

PREDICTING SMOLTING IN JUVENILE ATLANTIC SALMON (*SALMO SALAR*):  
TIME COURSE OF THE RELATIVE EFFECTIVENESS OF BODY  
MORPHOLOGY AND SIZE.

2005

JAMIE PEARLSTINE

M.S., UNIVERSITY OF MASSACHUSETTS AMHERST

Directed by: Dr. Benjamin Letcher

The goal of this study was to test the relative effectiveness of morphological measurements and body size in predicting smolt age of Atlantic salmon (*Salmo salar*) and to determine the time course of body size and shape differences between smolt ages. Analyses were conducted on Atlantic salmon age-0+ to age-2+ that were stocked as fry in the West Brook in Massachusetts, USA and on laboratory-raised Atlantic salmon age-0+ to age-1+. Using both body size and shape, we could partition fish into future early or late smolts at age-0+ fall, although the predictive ability of body shape was somewhat weaker than body size, especially in the laboratory. Classification success averaged 81% (size) and 79% (shape) in the field and 85% (size) and 73% (shape) in the laboratory. Despite differences in smolt age between the field and the laboratory, the relative timing of growth rate differences between future early and late smolts was similar in the field and the laboratory and peaked at 50-60% of development from fry to smolt. While body shape differed between early and late smolts well before smoltification, it did not improve classification based on size alone.

### **Publication:**

Pearlstein, J. H., B. H. Letcher, and M. Obedzinski. 2007. Early discrimination of Atlantic salmon smolt age: Time course of the relative effectiveness of body size and shape. *Transactions of the American Fisheries Society* 136: 1622-1632.