

University of Idaho  
Division of Statistics

Master's Thesis Defense

**TaeHo Hong**

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**Selection of Strata with AIC for Fish Outmigration Estimation**

**ABSTRACT**

Wu (2000) defined a product binomial model for estimating the numbers of fish outmigrating from a given water system. In that model marked fish are placed upstream of the trap to provide information on trap efficiency. Simulation shows that the maximum likelihood estimator can be quite biased and have large root mean square error when the numbers of outmigrants and the numbers of marked fish are small. Relative bias and standard error diminish as these numbers increase. In some cases the trapping season must be broken into periods of fairly constant trap efficiency to minimize bias. I demonstrate that Akaike's Information Criteria is one method for determining strata so that there is a fair compromise between bias and variance.