

Some thoughts on model forms

Mark Scheuerell

3/14/2022

Background

The total return of adult salmon of species i in year t , $Y_{i,t}^A$, is the sum of natural- and hatchery-origin fish, $N_{i,t}^A$ and $H_{i,t}^A$, respectively, such that

$$Y_{i,t}^A = N_{i,t}^A + H_{i,t}^A.$$

Unlike natural-origin fish, the number of hatchery-origin adults in year t $H_{i,t}^A$ is disconnected from the number of hatchery-origin adults in some years prior, and instead is merely the total number of hatchery-origin juveniles released some k years prior $H_{i,t-k}^J$ times their juvenile-to-adult survival,

$$H_{i,t}^A = \sum_{k=1}^K s_{i,t-k}^H H_{i,t-k}^J.$$