Main Menu Text

RRS2 A statistical tool to conduct an a priori analysis of the precision and accuracy of a maximum likelihood estimator of the relative reproductive success (RRS) of hatchery-origin spawners using multiple brood years

Purpose of tool (main menu)

RRS2 is used to compare study designs aimed at estimating the relative reproductive success (RRS) of hatchery-origin spawners using multiple brood years. The inputs include the true log(RRS) of hatchery-origin fish the total sample size of progeny recovered. The outputs are estimates of the precision and accuracy of the maximum likelihood estimate of log(RRS), which can be used to guide the selection of a study design

User’s Guide

Choosing Input Parameters

|  |  |
| --- | --- |
| **Number of wild-origin spawners (Sw)** | Number of wild-origin spawners (one value for each year). Each value should be a whole numbers greater than zero. |
| **Number of hatchery-origin spawners (Sh)** | Number of hatchery-origin spawners (one value for each year). Each value should be a whole number greater than zero. |
| **Sample size of progeny (n)** | Number of progeny examined for origin of parents (one value for each year). Each value should be a whole number greater than zero. |
| **Type I Error Probability (alpha)** | Type I error probability. Enter a number between zero and 1. The value is typically 0.05. |
| **Actual log(RRS) (delta)** | The actual value of the natural log of relative reproductive success of hatchery-origin spawners. Any value. |
| **Analytical** | Choose this option when the total spawners is sufficiently large so that formulae for SE and CV for the estimate of log(RRS) are reasonably accurate. To determine what sample sizes are sufficient to accurately estimate SE and CV, compare the analytical results to the Monte Carlo results. The Monte Carlo results do not depend on large-sample properties. |
| **Monte Carlo** | Choose this option when the total number of spawners is too small for the assymptotic formulae for SE and CV for the estimate of log(RRS) to hold. Increasing the number of simulations will increase the accuracy of the output SE and CV values. Experiment with the number of simulations until the desired accuracy is achieved. |
| **Number of simulations (NSIM)** | The number of simulations used in the Monte Carlo calculation method. Greater accuracy in the calculation of SE, CV, and bias may be obtained by increasing NSIM. |

**Interpreting Results** [http://www.onefishtwofish.net/images/up_arrow.jpg](http://www.onefishtwofish.net/rrs/#info_top)

Output parameters are those displayed on the right side of the results table (unshaded cells).

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| --- | --- |
| **SE\_delta** | The standard error of the estimate of log(RRS) |
| **CV\_delta** | The coefficient of variation of the estimate of log(RRS) |
| **BIAS\_delta** | The relative bias of the estimate of log(RRS) |
| **power** | The probability of rejecting the null hypothesis of log(RRS)=0 when the true log(RRS) is delta |