Untitled

= the number of spawners in brood year

= the number of juvenile emigrants with life history originating from brood year

The number of juveniles of each of 4 life-histories is a nonlinear function of of the number of spawners. To allow the number of juveniles in the early-migrant life histories (fry, summer parr, and fall parr)

Beverton-Holt function of the number of spawners

with multivariate lognormal error,

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The number of natural-origin adult returns is,

where = survival from juvenile to adult for lifestage in year , proportion of adults of lifestage that return at age , and

= the number of natural origin adults taken for broodstock in brood year

+ \_t

= rho

c= carcass

, is the median day of brood year that a given life history emigrates from the natal stream.

was given as a data and [.125,.725,.15] for subyearling emigrant life histories and [.06,.65,.29] for yearling smolt emigrants.

The number of hatchery origin spawners is

The total number of spawners in a brood year is then .