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| Description of parameters required by *paras.csv* for the model. Each row of *paras.csv* corresponds to one simulation. | |
| **Parameter** | **Description** |
| **scenarios** | Name of the set of scenarios that the simulation belongs to. |
| **sim** | Unique name of the simulation.  Output files will include both **scenarios** and **sims** in their names. |
| **years** | Total number of years to run the simulation for. |
| Distribution of strategies across farms. | |
| **Hcol** | The name of the column in *H.csv*to use in the simulation. The column describes which strategy/strategies are used on each farm. |
| **years.start** | The number of years until the distribution of strategies in **Hcol** are used. |
| **Hcol.start** | The column of *H.csv* (distribution of strategies) to use in the first **years.start** until **Hcol** is used instead.  ***Hcol.start*** *and* ***years.start*** *can be used to allow for a ‘spin-up’ period (before* ***Hcol*** *is used). But can also use this to test 2 different distributions staggered through time.* |
| Treatment triggers for farms | |
| **kws** | Lice limit (adult lice per fish) that triggers a discrete treatment, during the summer/winter weeks.  *Set at* ***kws*** *= 1 to match the Norwegian limit of 0.5 adult females per fish (assuming equal numbers of males and females).* |
| **ksp** | Lice limit (adult lice per fish) that triggers a discrete treatment, during the spring weeks.  *Set at* ***ksp*** *= 0.4 to match the Norwegian limit of 0.2 adult females per fish (assuming equal numbers of males and females).* |
| **kmax** | Lice limit (adult lice per fish) that triggers a forced harvest (or a similar measure) of the farm. **kmax** > **kws**. *Eyeballing the data in barentswatch.no, farms will apparently harvest fish at ~****kmax*** *= 2 adults per fish (although this is highly variable).* |
| **xmax** | Proportion of lice (all parasitic stages) that survive a forced harvest (or similar), when adult abundance > **kmax**.  *Default assumption* ***xmax*** *= 0 (harvest removes all fish, and therefore all lice).* |
| Lice biology parameters (survival & larval attachment). Growth and fecundity are temperature-dependent and are in separate data frames. | |
| **muA** | Proportion of adults that survive each week (given the background mortality rate).  *Set at* ***muA*** *= 0.838* |
| **muP** | Proportion of pre-adults that survive each week (given the background mortality rate).  *Set at* ***muP*** *= 0.838* |
| **muC** | Proportion of chalimus that survive each week (given the background mortality rate).  *Set at* ***muC*** *= 0.986* |
| **v** | Proportion of larvae that attach to a host and become larvae, after they disperse to a farm.  *Set at* ***v*** *= 0.05*  *If we update the dispersal matrices (D), we would assign each farm unique* ***v*** *values, calculated according to the size of the farm and the size of the dispersal model grid cells (see Kragesteen et al. 2023). This was started in the ‘Dnew’ version of the model.* |
| Assign the effect of the 2 strategies (X and Y) on susceptible lice. | |
| **stratx** | Assign whether strategy x is continuous (**stratx** = cont) or discrete (**stratx** = disc). |
| **xA** | The proportion survival of susceptible adults, after treatment by discrete strategy x.  ***xA*** *is ignored in the model if* ***stratx*** *= cont (but to be safe, should make* ***xA*** *= 1). Same for other parameters* |
| **xP** | The proportion survival of susceptible pre-adults, after treatment by discrete strategy X. |
| **xC** | The proportion survival of susceptible chalimus, after treatment by discrete strategy X. |
| **xv** | Proportion of susceptible larvae (**relative to normal levels**) that attach to a farm using continuous strategy X.  *E.g. If strategy X reduces attachment by 75%, then* ***xv*** *= 0.25* |
| **xf** | Proportion fecundity of susceptible adults (relative to normal) at a farm using continuous strategy X. |
| **xs** | Proportion weekly development rate of susceptible lice (relative to normal) at a farm using continuous Strategy X. |
| **xmu** | Proportion survival of susceptible chalimus (after background mortality) (relative to normal) at a farm using continuous Strategy X. |
| **straty** | Assign whether strategy x is continuous (**stratx** = cont) or discrete (**stratx** = disc). |
| **yA** | Proportion adult survival from discrete treatment Y |
| **yP** | Proportion pre-adult survival from discrete treatment Y |
| **yC** | Proportion chalimus survival from discrete treatment Y |
| **yv** | Proportion attachment rate with continuous strategy Y |
| **yf** | Proportion fecundity with continuous strategy Y |
| **ys** | Proportion development rate with continuous strategy Y |
| **ymu** | Proportion chalimus survival with continuous strategy Y |
| Assign fitness advantages conferred by R or T alleles. R and T can be selected for by the same or different strategies. | |
| **R.sel** | Assign which strategy imposes selection for the R allele. Either **R.sel** = xOR **R.sel =** y |
| **RR.ad** | The advantage conferred by RR genotypes in response to the strategy assigned by **R.sel**. Values for **RR.ad** are added to the proportion fitness values imposed by the strategy.  *E.g.*  **straty** = cont **yv** = 0.2  **R.sel** = y **RR.ad** = 0.3 *Under strategy Y: SS attachment =* **v\*yv** *RR attachment =* **v\*(yv + RR.ad)**  *For now, advantage parameters are applied for all parameters that are affected by the strategy (i.e. proportions <1)*. *There are fail-safes in the model to ensure that the final proportion values are capped at 1.* |
| **RS.ad** | The advantage conferred by RS genotypes in response to the Strategy assigned by **R.sel**. |
| **SS.ad** | The advantage conferred by SS genotypes in response to the Strategy assigned by **R.sel**.  *Most of the time, will leave* ***SS.ad*** *= 0 (there is no additional advantage of the SS genotype under selection).* |
| **T.sel** | Assign which strategy imposes selection for the T allele. Either **T.sel** = xOR **R.sel =** y |
| **TT.ad** | The additional advantage conferred by the TT genotype when exposed to the strategy assigned by **T.sel.** |
| **TU.ad** | The additional advantage conferred by the TU genotype when exposed to the strategy assigned by **T.sel**. |
| **UU.ad** | The additional advantage conferred by the UU genotype when exposed to the strategy assigned by **T.sel**. |
| Assign fitness trade-offs to the R and S alleles. Can make lice with these alleles have lower attachment, fecundity, growth or survival rates. | |
| **vR.to** | The fitness trade-off of the R allele to larval attachment. This value is subtracted from **v** for every R allele.  *E.g. if R AND T alleles come with trade-off to attachment:*  *The attachment success of RRTU lice =* ***v\*(xv+RR.ad)\*(yv+TU.ad) – (2\*vR.to – vT.to)*** *Note vR.to will be multiplied by 2 for both R alleles.*  *If the strategy assigned by* ***R.sel*** *is* ***disc****, then* ***vR.to*** *trade-offs are applied to all farms.  If the strategy assigned by* ***R.sel*** *is* ***cont****, then* ***vR.to*** *trade-offs are applied only to farms not using that strategy.* |
| **fR.to** | The disadvantage of the R allele to fecundity, due to a fitness trade-off. |
| **sR.to** | The disadvantage of the R allele to development rate, due to a fitness trade-off. |
| **muR.to** | The disadvantage of the R allele to chalimus survival, due to a fitness trade-off. |
| **vT.to** | The disadvantage of the T allele to larval attachment, due to a fitness trade-off. |
| **fT.to** | The disadvantage of the T allele to fecundity, due to a fitness trade-off. |
| **sT.to** | The disadvantage of the T allele to development rate, due to a fitness trade-off. |
| **muT.to** | The disadvantage of the T allele to chalimus survival, due to a fitness trade-off. |
| Starting proportions and locations of R and T alleles | |
| **prop.RSUU** | Proportion of lice on farms with RSUU genotype. (Assuming farm is within the range **lwr.latR – upr.latR**) |
| **prop.SSTU** | Proportion of lice on farms with SSTU genotype. |
| **prop.RSTU** | Proportion of lice on farms with RSTU genotype. |
| **lwr.latR** | Lower latitude limit within which R allele is initially present. |
| **upr.latR** | Upper latitude limit within which R allele is initially present.  *Only farms within this latitude range will start with* ***prop.RSUU*** *and* ***prop.RSTU*** *RS lice.* |
| **lwr.latT** | Lower latitude limit within which T allele is initially present. |
| **upr.latT** | Upper latitude limit within which T allele is initially present. |
| Strategy Z – this third treatment type is available. Always discrete, *never* imposes selection on louse genotypes | |
| **zA** | Proportion survival of adults after treatment with strategy z. |
| **zP** | Proportion survival of pre-adults after treatment with strategy z. |
| **zC** | Proportion survival of chalimus after treatment with strategy z. |