**Breeds**

- Egg phase is not modelled. The real number of eggs is not modelled but a number of surviving fish after the critical period of emergence, then new trout should reveal in the model after the egg-development period, otherwise they’re subject to mortality over a period in which egg mortality is being applied too.

**Movement**

- Why fish do not move in the ocean? That decreases the chance of being infected by parasites. Although I understand it’s a question of scale.

**Mortality**

- Freshwater mortality is the same for juveniles, sub-adults and adults, but mortality rates typically differ among age classes.

- Fish also die when population is over K. Why not a Beverton-Holt function as in Reed et al. (2011) to model density dependence? At any case, mortality due to exceeding K is in random order, while individuals with higher quality (or more dominant) should have an advantage for survival (maybe implementing a size-based hierarchy for the “grim-reaper” procedure?).

- Mortality rate at sea in the model is the same for infected and healthy individuals, but:

Salmon lice epizootics can reduce growth and increase mortality risk for sea migrating salmonids (Costello, 2009; Fjørtoft, Borgstrøm, & Skaala, 2014; Wells et al., 2006, 2007), thereby increasing the costs of sea migration. (Review by Thorstadt et al. 2015 for sea trout)

Higher survival among treated salmon and sea trout (Krkosek et al., 2013; Skaala, Kalas, & Borgstrøm, 2014; Skilbrei et al., 2013; Vollset et al., 2016).

In the review of Thorstadt et al. (2015) there’re references for population effects of salmon lice on sea trout in Ireland. So increased mortality rates in infected sea could be estimated, I guess.

- No extra mortality during reproductive migration and no extra mortality during migration to sea are modelled, so same mortality for resident adults and anadromous. (Accounting for such extra mortalities might decrease the overall fitness advantage of adopting an anadromous life-history strategy.)

- Mortality at sea is probably size-dependent: mortality decreases with body size in similar-age smolts, but it’s not the same for smolts than for veteran migrants (mortality increases with age). (Jonsson & Jonsson 2011)

**Migratory behaviour**

- Only genetic basis, no environmental influence.

- Same threshold for males and females but overall perception in the literature is that sea trout females tend to adopt the anadromous life history more than males (review by Thorstadt et al. 2016). Is that what you modelled when the first locus is sexually antagonistic in males?

**Migration**

- Timings: why migrate at 1st January? Typical migration time downstream and into the sea for sea trout is spring-early summer, and generally from end of February to August (reviews by Jonsson & Jonsson 2011, Thorstadt et al. 2016).

- What’s the biological meaning of “quality”? Why not a “real” trait like size (length or mass) which would depend on growth (different growth rates in the freshwaters and the sea, and for healthy and infected fish)? More realistic and could be parameterized in some way, no way of parameterizing realistically an abstract variable as quality.

\*\*\* Modelling sea growth under infestation:

* More use of delousing habitats (river or close to river outlet) at high infestation levels which reduced feeding opportunities at sea (Halttunen et al. 2018)
* Fish grow less at sea when infected (Godwin, Dill, Krkosek, Price, & Reynolds, 2017; Shephard et al., 2016). (Review by Thorstadt et al. 2015)

Modelling growth alternative 1: infected fish remain infected all the time spent in the sea and growth in infected fish is lower than in healthy fish

Modelling growth alternative 2: three compartment are modelled (river, estuary and ocean), infected fish can either move to the estuary to delouse during a time, but there the growth is lower than at sea, or remain infected at sea with a lower growth than a healthy fish.

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- Any way to calibrate the probability of infection and its effect on quality?

**Reproduction**

- Timing: in the model reproduction takes place in mid-winter (February) but sea trout typically spawn in autumn (variable between September and December). How long return migration takes place before spawning is quite variable, from several months to just shortly before spawning. (Review by Thorstadt et al. 2016)

Infestation by salmon lice can produce premature freshwater return of individuals with poor condition. (Review by Thorstadt et al. 2015)

- No mortality linked to spawning.

- Males can reproduce several times during a reproductive season, which is ok but they should have time to recover condition between consecutive reproductive events (right now they could even take part in different events even the same time step; is that realistic?).

- One male fertilizes all eggs, so it’s the father of all new trout, which is not necessarily so in nature. In my model, several males can fertilize the eggs from a given redd (one egg is fertilized by just one male).

- Timing of post-spawn migration to sea, they wait till next migratory season, but veteran migrants typically migrate back to sea after spawning earlier than new smolts. But that’s not relevant.

**Fecundity**

- How’s the logistic parameterized? Made up?