**Updates to model 28 June 2019**

Fecundity is now based on the relationship described for Irish trout in the Erriff

N = a \* L ^ b, where a = 0.000238781, b = 2.603, and L is length in mm. So, a 300 mm fish will produce 669.8 eggs. Quality could now be thought of as length in mm. I divide this equation by 50 to give us manageable numbers to work with. <http://www.freshwaterlife.org/projects/media/projects/images/1/50094_ca_object_representations_media_163_original.pdf>

I made a new variable called lifespan which is currently set at 416 = 8 years in weeks. Trout cannot exceed this age.

*if age = lifespan [die]*

All fish start out with the same quality i.e. anadromous fish don’t get their boost from the beginning they have to earn it through migration (see below).

*set quality random-normal res\_quality\_mean res\_quality\_sd*

During a set point while at sea trout run a new procedure called *check-quality*

*if my-week = 43 and habitat = "marine" and sea-time > 80 [check-quality]*

This procedure asks the anadromous fish if they have parasites. If they do, they have a chunk removed from their quality. If they don’t have parasites, they get a boost to their quality. This can happen multiple times based on repeated marine migrations.

*to check-quality*

*ifelse state = "parasitised" [ set quality quality - paras\_quality] [set quality quality + anad\_quality]*

*end*

I removed the *time-since-repro* value because the fish can only breed at one time point per year.

I changed the mortality procedure to correct the bug Dani noticed where freshwater fish were facing mortality twice.

*to mortality*

*ask turtles with [sex = "male"]*

*[*

*let prob-deathM mortalityM*

*ifelse habitat = "fresh"*

*[*

*; set prob-death mortalityM ; chance of dying on any turn in freshwater*

*if random-float 1 < prob-deathM [die]*

*] ; death procedure*

*[*

*ifelse state = "healthy"*

*[ set prob-deathM mortalityM \* anad-death-multiplierM ] ; higher likelihood of death while at sea*

*[ set prob-deathM mortalityM \* anad-death-multiplierM \* parasite-load ] ; higher likelihood again of dying if parasitized while at sea*

*if random-float 1 < prob-deathM [die] ; death procedure ] ]*

Parasitised fish at sea become healthy again when they return to freshwater.

*to migrate-to-freshwater*

*move-to one-of patches with [pcolor = cyan]*

*set habitat "fresh"*

*set state "healthy"*

*set sea-time 0*

*end*

I also round the FecAcc value the mothers have that tracks their fitness so it's an integer

*set FecAcc FecAcc + round fecundity*