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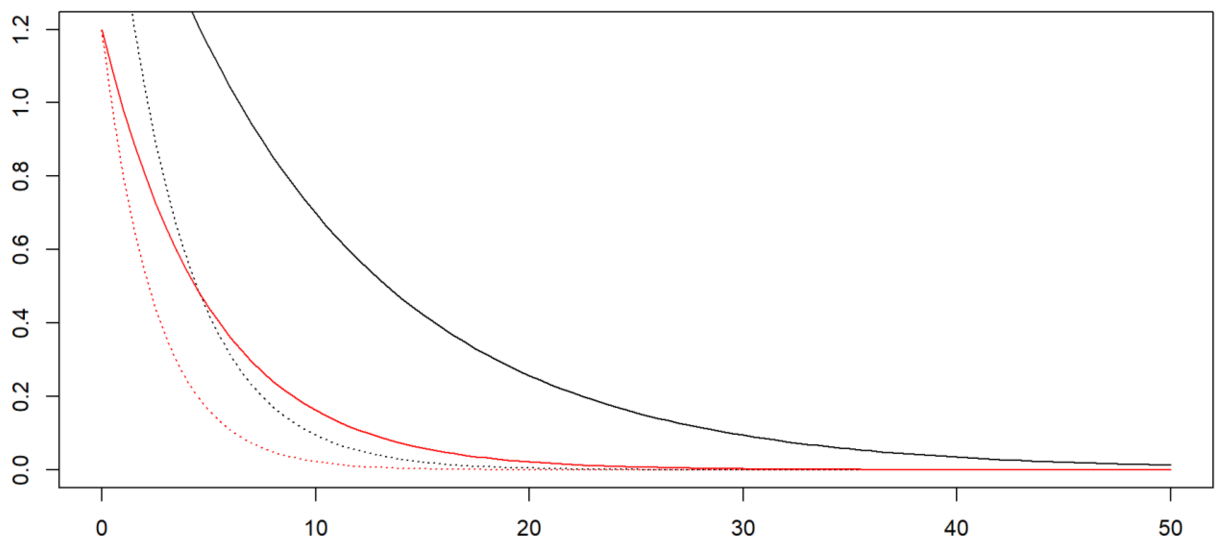
Analysis of Environmental Data

Lab 5

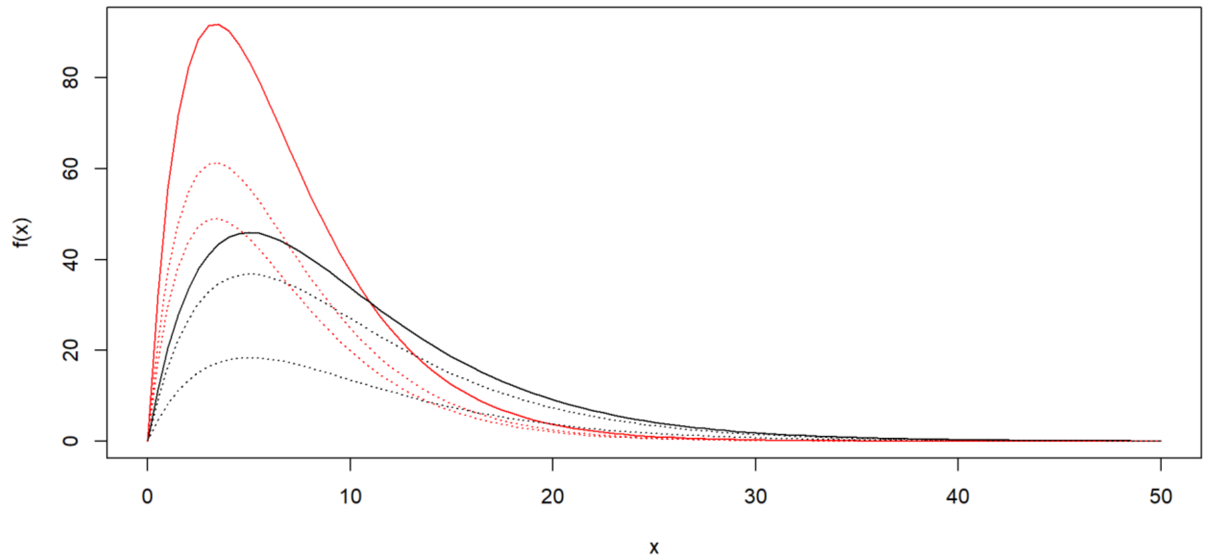
1. exp_fun = function(x, a, b)
   {
    return(a *exp(-b * x))
   }



2.

3. Parameter a is the height of the curve at the start.

4. Parameter b is the rate of decay. The higher the number, the steeper the initial slope of the curve.



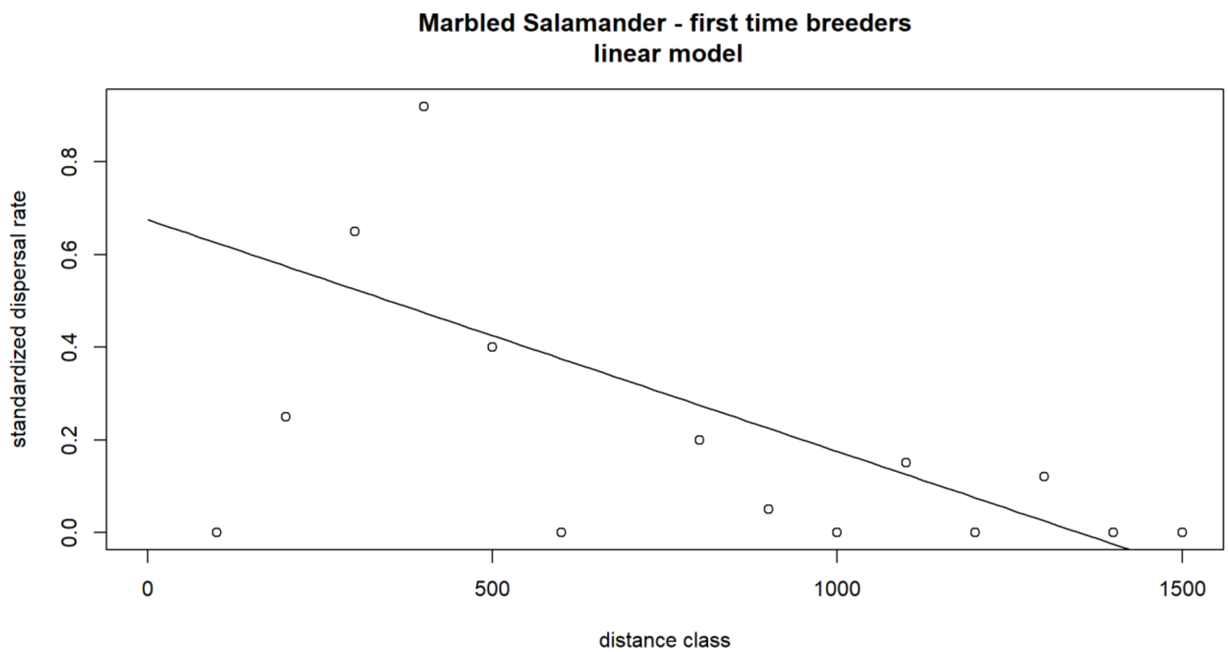
5.

6. Parameter a changes the initial slope of the curve where higher values cause steeper slope.

7. Parameter b dictates the height of the peak of the curve, where smaller b values cause the curve to peak at higher y values given the same value for parameter a.

8. curve(line_point_slope(x, 750, 0.3, -0.0005), add = TRUE)

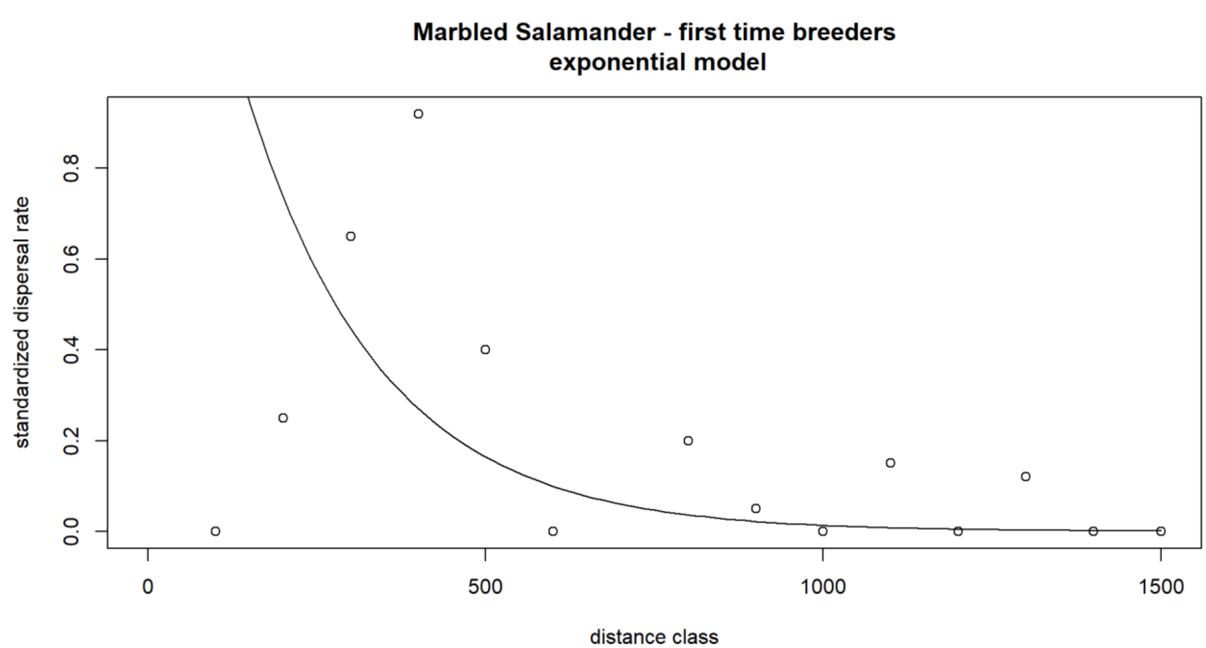
   I chose a negative slope and tried to use a point value that split the points of the plot fairly evenly.



9.

10. curve(exp_fun(x, 2, 1/200), add = TRUE, from = 0, to = 1500, ann = FALSE, axes = TRUE, ylab = "f(x)"); box()

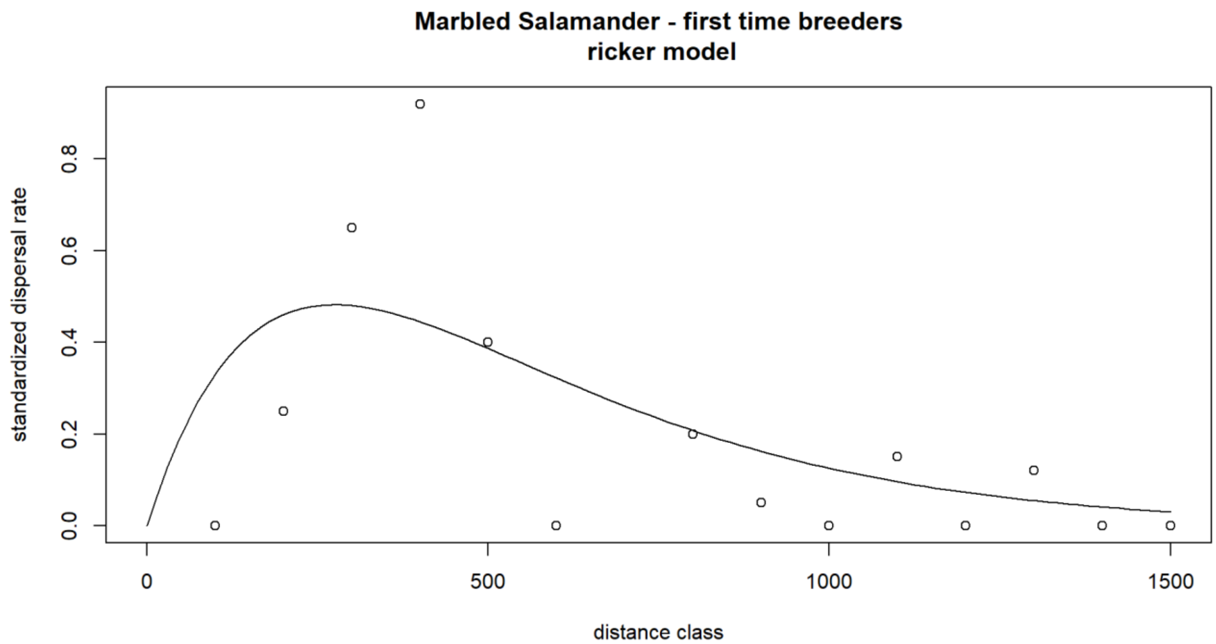
    I chose 2 and 1/200 just by trial and error to try and get the curve to split the data points as best as possible.



11.

12. curve(ricker_fun(x, 1/210, 1/275), from = 0, to = 1500,
   add = TRUE, ylab = "f(x)", xlab = "x")

   I chose 1/210 and 1/275 by trial and error



13.

14. observed= dispersal$disp.rate.ftb

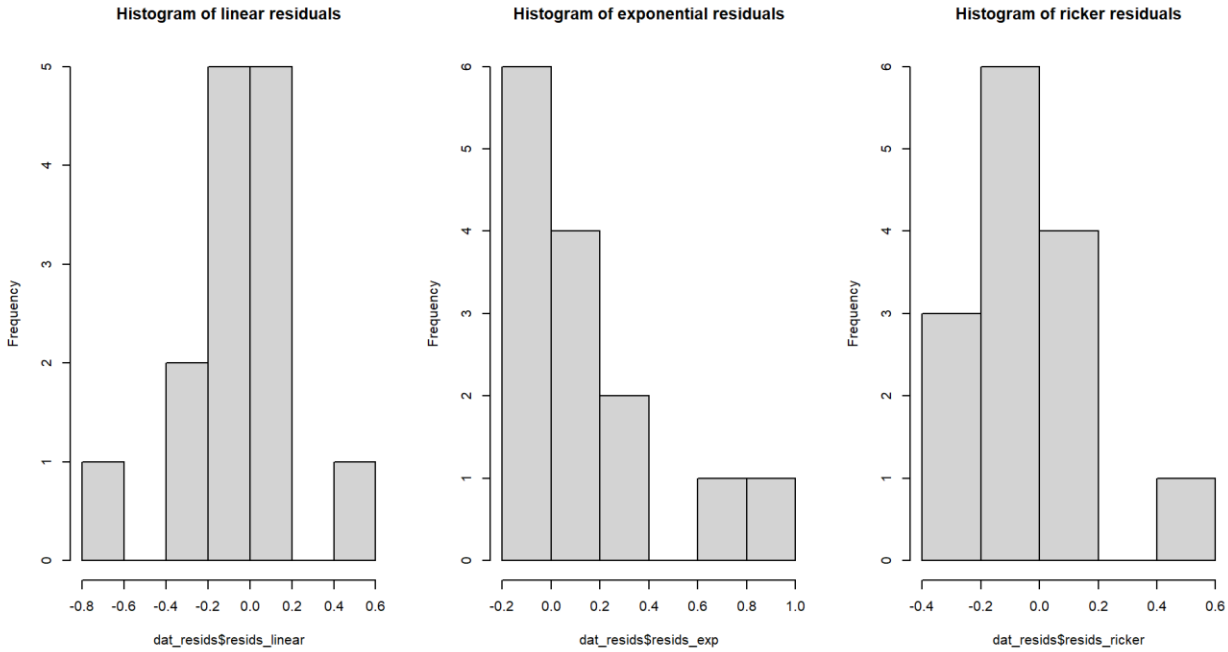
   ricker_predicted= ricker_fun(dispersal$dist.class, 1/210, 1/275)
   resids_ricker= c(observed - ricker_predicted)

   exp_predicted= exp_fun(dispersal$dist.class, 1/200, 1/200)
   resids_exp= c(observed- exp_predicted)

   linear_predicted= line_point_slope(dispersal$dist.class, 750, 0.3, -0.0005)
   resids_linear= c(observed - linear_predicted)

   dat_resids= data.frame(dispersal$disp.rate.ftb,resids_linear, resids_exp, resids_ricker)

15.



Histogram of linear residuals
Frequency
dat_resids$resids_linear
Histogram of exponential residuals
Frequency
dat_resids$resids_exp
Histogram of ricker residuals
Frequency
dat_resids$resids_ricker