Corrections and Addenda

Welcome. As much as I tried to make the book error free, I am slowly discovering them (which we call misprints, rather than errors). My apologies if any of these have caused confusion for you.

In addition to listing corrections here, I will list new ideas and discoveries about the material in the book as they appear. So keep visiting this document.

Chapter 1

Egg Size in Atlantic Salmon Here's an idea suggested by Erin Middleton (a senior majoring in Environmental Studies and minoring in Math) when we worked through the book in fall 2007.

Eqn 1.7 accounts for survival $S(x)$ as a function of egg size x in a way that implicitly assumes big eggs are better because they give more resources to offspring at the time of first feeding. But, suppose that big eggs are also more attractive to predators – for exactly the same reason. Then we might use $p(x)$ to model the probability that an egg of size x is eaten by a predator. In that case, fitness from the offspring's perspective is

$$S(x) = (1 - p(x))(1(-\frac{x_{min}}{x})^a) \tag{1}$$

and from the mother's perspective is still

$$R(g, x) = \frac{g}{x} S(x) \tag{2}$$

The intuition that both Erin and I have is that the inclusion of $p(x)$ will reduce the parent conflict, since the offspring will no longer want to be as big as possible. We have not done any calculations but it might be worthwhile to try with $p(x) = 1 - exp(-\epsilon x)$, where ϵ is a parameter (you can think of what is in the book as the case in which it is 0).

Chapter 2

pg 28, line 4. This should read 'age at maturity declines as mortality increases'. (Pretty obvious from the figure)

Eqn 2.24. The middle term on the right hand side should have the mean of $\lambda|$ in the denominator, as in $\frac{1}{\overline{\lambda}}(\lambda - \overline{\lambda})$

Eqns 2.24 and 2.25 In both of these a 1/2 is missing, so we should have $\frac{1}{2\overline{\lambda}^2}(\lambda - \overline{\lambda}^2)$ in Eqn 2.24 and $\frac{1}{2\overline{\lambda}^2}Var(\lambda)$ in Eqn 2.25 (and the minus signs, of course)

Exercise 2.8. In line 2, B should be replaced by b.

pg 45, line -7: This should read $D(\alpha, \beta) < 0$.

Chapter 3

Eqn 3.28 The summation should be over j, not i.

Exercise 3.17 In the second line, it should be $Var(Y)$, not $Var(A)$. Here is another hint. First define $Z = exp(\sigma X)$ and then $Y = Ae^{-\frac{1}{2}\sigma^2}Z$. You should be able to do the entire computation without any integrals by using Eqns 3.88 and 3.91.

Exercise 3.18 In the fourth line, $\beta + a - s$ should be replaced by $\beta + \alpha - s$.

Chapter 4

Chapter 5

Chapter 6

Stock and Recruitment I regret that there is an error in Eqn 6.2, which should be written as

$$R = \frac{aS}{1 + bS} \tag{3}$$

When we do that, all the discussion below Eqn 6.2 is accurate (ie. that R is proportional to S when spawning stock size is small). Also note that b now has the same units in Eqns 6.1 and 6.2. And finally note that the Taylor expansion for both e^{-bS} and $\frac{1}{1+bS}$ when S is small is $1 - bS$, so for small S, both the Ricker and Beverton-Holt give the same kind of density dependence. However, Exercise 6.2 is based on the equation as in the text.

pg 215, line above Eqn 6.7: delete the first occurrence of 'model'.

Figure 6.6: The label on the y-axis should say 'growth rate'

Eqn 6.14: There is an extra) at the very end of the equation.

Eqn 6.16: The right hand side of the third equation should be $E(t) - \Delta E_{-}$.

pg 220, Figure 6.8c: The lines are drawn very poorly here. The lower line should not cross the dN/dt isocline and the upper one should – all heading towards the steady state

$N = K, E = 0$.

pg 224, line -7: delete 'for'

Exercise 6.10: In line 2, replace t_0 by a_0 [and use a instead of t in the von Bertalanffy growth equation]. In the first line of Eqn 6.27, replace R by N_0.

Exercise 6.11: In part b) you should plot $S(t)$ on the x-axis and $S(t+1)$ on the y-axis.

Excercise 6.13: In the likelihood calculation, use σ=0.15. Also, note that the correct equation is $Z(t) = log(CPUE(t)) - log(I_{pre}(t))$

Chapter 7

Chapter 8