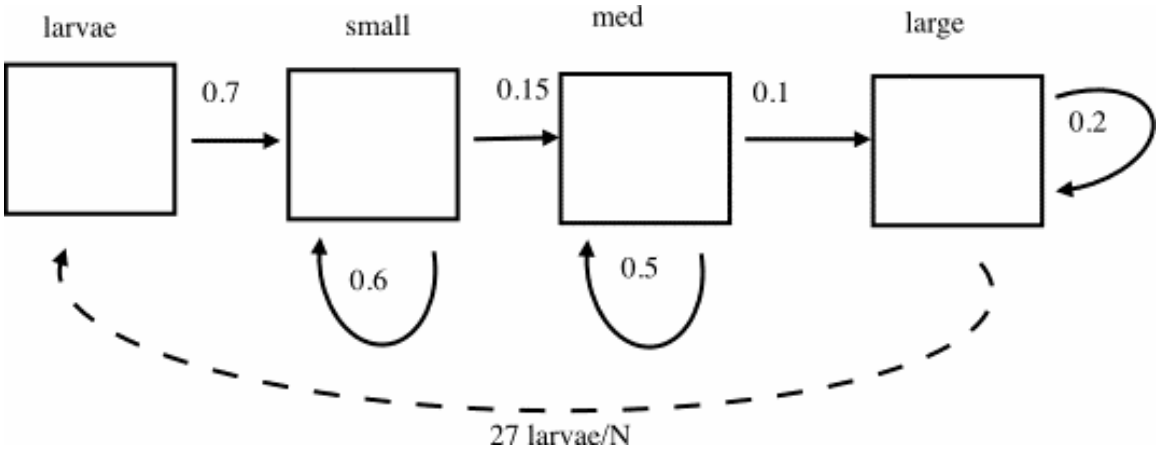
Solutions to Kareiva & Marvier, Chapter 8
Conservation Biology
Spring 2011

2. Take the geometric mean = lambda over the entire time was **0.9961** even though two of the three years were "good years." Note that the arithmetic average would have been a bit higher, 0.9967

3. Abalone



small will die? = 1-lx – promotion chance = 1-.6-.15=0.25
small tto large in two years? = 0.15*0.1=0.015
mx for current small over next two years?
= 1-(Chance survive this year as small *chance of surrviv e next year as small or med + chance of becoming med for next year * chance of suviving as med or being large)
= 1-(0.6 * 0.75+0.15*0.6)
= 1-(0.45+0.09) = 1-0.54
= 0.46

Matrix: green is b_x, yellow is l_x and orange is chance of remaining alive in same stage.

larvae	sm	med	large	N
0	0	0	27	N (t, larvae)
0.7	0.6	0	0	N (t, sm)
0	0.15	0.5	0	N (t, lmed)
0	0	0.1	0.2	N (t, large)
0	0	0	0	

Thus, notice that the number of larvae at time t+1 =
N(t,l)*0+N(t,s)*0+N(t,med)*0+N(0,Large)*27
The number of small abalone at time t=1 =
N(t,l)*0.7+N(t,s)*0.6+N(t,med)*0+N(0,Large)*0
The number of medium abalone at time t=1 =
N(t,l)*0+N(t,s)*0.15+N(t,med)*0.5+N(0,Large)*0
etc