

## LIFE TABLES & POPULATION STATISTICS

A table of numbers of individuals in a population at each age interval is called a life table. The data in a life table can be used to generate survivorship curves (and thus determine the population's reproductive strategy and make population projections) and calculate individual life expectancy.

### Life Table Information:

$x$  = age interval

$N_x$  = numbers of individuals alive in each age interval

$l_x$  = survivorship; the proportion of people from the **entire original population** that survive to the beginning of each age interval ( $x$ )

$s_x$  = proportion of the **current age interval** ( $x$ ) population that survive until the next age ( $X+1$ ) interval

$m_x$  = proportion of the **current age interval** ( $X$ ) population that die during the time from  $X$  to  $X+1$

$b_x$  = fecundity; the number of births **per individual** in the current age interval

$R_0$  = net reproductive rate; the average number of babies produced per female in her lifetime in the entire population. To calculate, first calculate ( $l_x \times b_x$ ) for each age interval, then sum them up. SO if  $R_0 > 1.0$ , then the population is projected to grow.

### Life table problem:

The life table below contains population counts for a blob population on Mars over a four year period. Complete the table. *Skip the last two columns for now.*

X	$N_x$	# dying	$l_x$	$s_x$	$m_x$	$b_x$	$l_x b_x$
0	500						
1	400						
2	200						
3	0						

Now consider the following additional information:

- all individuals alive at  $X=1$  produce 1 offspring
- half of the individuals alive at  $X=2$  produce 2 offspring, while the other half produces a total of 30 offspring

Complete  $b_x$  and  $l_x b_x$

Based on all of the above, what is the  $R_0$  for the blob population? Is the population growing?