

NAME \_\_\_\_\_  
 ID \_\_\_\_\_

**BIOE 370, Optional Demography Homework**

A. From the data given, complete the life-table and calculate the following nine items. *Show your calculations on separate sheets. If you use a spreadsheet, show at least one example calculation for each variable.*

1.  $s_x$  = age specific probability of survival
2.  $l_x$  = probability of survival from birth to age x
3.  $l_x m_x$  = age specific contribution to population growth
4. GRR = gross reproductive rate
5.  $R_0$  = net reproductive rate
6. T = generation time
7. r = intrinsic rate of increase (**can use approximate solution**)
8.  $E_x$  = age-specific life expectancy
9.  $v_x$  = age-specific reproductive value

Age in yrs	$N_x$	$m_x$	$s_x$	$l_x$	$l_x m_x$	$x l_x m_x$	$E_x$	$v_x$
0	2000	0.0						
1	900	0.0						
2	400	3.3						
3	110	4.0						
4	50	5.1						
5	30	4.5						
6	8	2.9						
7	0	0						

GRR = \_\_\_\_\_

$R_0$  = \_\_\_\_\_

T = \_\_\_\_\_

r = \_\_\_\_\_

Give the numeric value **and units** for each

B. You are a wildlife manager and must decide between two management options to maximize the population's growth rate: Option A increases the mean fecundity of two year olds ( $m_2$ ) from 3.3 to 4.3. Option B increases  $m_4$  from 5.1 to 6.1? *Which has more of an effect on population growth? State why.*