

**TABLE 097-3**  
**Version 1.0 October 28, 2005**

Life-Table Report  
 Variables by Day  
 Population Name

Restricted to:

Dates: DD/MM/YY to DD/MM/YY

Geographic Area: North American AZA members

Other filters: Hand reared

User selection options:

Q'x = All mortality, imports and exports

All reproduction (natural and artificial)

Births treated as 50% male, 50% female

Unknown sexes tallied in "Other" life table

(or unknown sexes included as 50% male, 50% female)

Age of most likely parent used when multiple parents present (4)

34 births to unknown aged parents added proportionately

Show all parameters set by user here or at bottom

Only need to show Risk Mx when user selected to base fecundity on reproductive opportunities

*Click here to see graphs*

| Day | Males |       | Females |       | Males  |       | Females |       | Males Females |       |
|-----|-------|-------|---------|-------|--------|-------|---------|-------|---------------|-------|
|     | Risk  | L'x   | Risk    | L'x   | RiskMx | Mx    | RiskMx  | Mx    | E'x           | E'x   |
| 0   | 201   | 1.000 | 201     | 1.000 | 0      | 0.000 | 0       | 0.000 | 4.413         | 4.413 |
| 1   | 93    | 0.463 | 93      | 0.463 | 0      | 0.000 | 0       | 0.000 | 7.377         | 7.377 |
| 2   | 66    | 0.328 | 66      | 0.328 | 0      | 0.000 | 0       | 0.000 | 8.985         | 8.985 |
| 3   | 70    | 0.389 | 70      | 0.389 | 0      | 0.500 | 2       | 0.500 | 9.087         | 9.087 |
| 4   | 80    | 0.400 | 80      | 0.400 | 14     | 0.179 | 14      | 0.179 | 8.985         | 8.985 |
| 5   | 98    | 0.421 | 98      | 0.421 | 48     | 0.521 | 48      | 0.521 | 8.296         | 8.296 |
| 6   | 100   | 0.421 | 100     | 0.421 | 77     | 0.519 | 77      | 0.519 | 8.314         | 8.314 |
| 7   | 123   | 0.219 | 123     | 0.219 | 126    | 0.540 | 126     | 0.540 | 7.314         | 7.314 |
| 8   | 137   | 0.205 | 137     | 0.205 |        |       |         |       |               |       |
| 9   | 153   | 0.202 | 153     | 0.202 |        |       |         |       |               |       |
| 10  | 158   | 0.199 | 158     | 0.199 |        |       |         |       |               |       |
| 11  | 162   | 0.198 | 162     | 0.198 |        |       |         |       |               |       |
| 12  | 164   | 0.199 | 164     | 0.199 |        |       |         |       |               |       |
| 13  | 157   | 0.192 | 157     | 0.192 |        |       |         |       |               |       |
| 14  | 154   | 0.188 | 154     | 0.188 |        |       |         |       |               |       |

Sufficient to show all these to 3 decimal places

When Qx includes anything but deaths, show Qx, Px, Lx, Ex Vx as Q'x, P'x, L'x, E'x and V'x

User selects which columns to see. Risk Qx always shown. When do not have "other" life-table, default are Lx, Mx and Ex. When have "other" life-table, Probably can only show Risk Qx and only two variable for males, females, other - default variables Lx, Mx. When showing confidence intervals, probably can only see one variable for males and females.

Note: Rates based on small sample sizes (Risk < 30) should be used with caution.

Other Counts:

Unknown birth dates: 3  
 Unknown Aged Sires: 12  
 Unknown Aged Dams: 27  
 Unknown Sires: 2  
 Unknown Dams: 4

These are the variables:  
 UnknownAge  
 UnkAgeSire  
 UnkAgeDam  
 UnkSire  
 UnkDam

**What this table might look like if user selected to put other sex in other table (not split 50%/50% to males / females). If user selected Lx and Ex and two variables to display.**

**Looks like there would be room for user to select two variables as long as one of them was not Mx (because if select Mx, need to show Risk Mx as well).**

| Day | Males |       | Females |       | Other |       | Males | Females | Other |
|-----|-------|-------|---------|-------|-------|-------|-------|---------|-------|
|     | Risk  | Lx    | Risk    | Lx    | Risk  | Lx    | E'x   | E'x     | E'x   |
| 0   | 201   | 1.000 | 201     | 1.000 | 201   | 1.000 | 4.413 | 4.413   | 4.413 |
| 1   | 93    | 0.463 | 93      | 0.463 | 93    | 0.463 | 7.377 | 7.377   | 7.377 |
| 2   | 66    | 0.328 | 66      | 0.328 | 66    | 0.328 | 8.985 | 8.985   | 8.985 |
| 3   | 70    | 0.289 | 70      | 0.289 | 70    | 0.289 | 9.087 | 9.087   | 9.087 |
| 4   | 80    | 0.260 | 80      | 0.260 | 80    | 0.260 | 8.985 | 8.985   | 8.985 |
| 5   | 98    | 0.250 | 98      | 0.250 | 98    | 0.250 | 8.296 | 8.296   | 8.296 |
| 7   | 100   | 0.219 | 100     | 0.219 | 100   | 0.219 | 8.314 | 8.314   | 8.314 |
| 9   | 123   | 0.219 | 123     | 0.219 | 123   | 0.219 | 7.314 | 7.314   | 7.314 |
| 11  | 137   | 0.205 | 137     | 0.205 | 137   | 0.205 | 6.752 | 6.752   | 6.752 |
| 15  | 153   | 0.202 | 153     | 0.202 | 153   | 0.202 | 5.838 | 5.838   | 5.838 |
| 23  | 158   | 0.199 | 158     | 0.199 | 158   | 0.199 | 4.902 | 4.902   | 4.902 |
| 75  | 162   | 0.198 | 162     | 0.198 | 162   | 0.198 | 3.927 | 3.927   | 3.927 |
| 108 | 164   | 0.199 | 164     | 0.199 | 164   | 0.199 | 2.908 | 2.908   | 2.908 |
| 187 | 157   | 0.192 | 157     | 0.192 | 157   | 0.192 | 1.981 | 1.981   | 1.981 |
| 241 | 154   | 0.188 | 154     | 0.188 | 154   | 0.188 | 1.000 | 1.000   | 1.000 |

**What the table might look like with confidence intervals:**

| Day | Males |          |              |          | Females |          |              |          | Other |          |              |          |
|-----|-------|----------|--------------|----------|---------|----------|--------------|----------|-------|----------|--------------|----------|
|     | Risk  | Lower CI | Mean         | Upper CI | Risk    | Lower CI | Mean         | Upper CI | Risk  | Lower CI | Mean         | Upper CI |
| 0   | 201   | 1.000    | <b>1.000</b> | 1.000    | 201     | 1.000    | <b>1.000</b> | 1.000    | 201   | 1.000    | <b>1.000</b> | 1.000    |

|     |     |       |              |       |     |       |              |       |     |       |              |       |
|-----|-----|-------|--------------|-------|-----|-------|--------------|-------|-----|-------|--------------|-------|
| 1   | 93  | 0.413 | <b>0.463</b> | 0.523 | 93  | 0.413 | <b>0.463</b> | 0.523 | 93  | 0.413 | <b>0.463</b> | 0.523 |
| 2   | 66  | 0.278 | <b>0.328</b> | 0.388 | 66  | 0.278 | <b>0.328</b> | 0.388 | 66  | 0.278 | <b>0.328</b> | 0.388 |
| 3   | 70  | 0.239 | <b>0.289</b> | 0.349 | 70  | 0.239 | <b>0.289</b> | 0.349 | 70  | 0.239 | <b>0.289</b> | 0.349 |
| 4   | 80  | 0.210 | <b>0.260</b> | 0.320 | 80  | 0.210 | <b>0.260</b> | 0.320 | 80  | 0.210 | <b>0.260</b> | 0.320 |
| 5   | 98  | 0.200 | <b>0.250</b> | 0.310 | 98  | 0.200 | <b>0.250</b> | 0.310 | 98  | 0.200 | <b>0.250</b> | 0.310 |
| 7   | 100 | 0.169 | <b>0.219</b> | 0.279 | 100 | 0.169 | <b>0.219</b> | 0.279 | 100 | 0.169 | <b>0.219</b> | 0.279 |
| 9   | 123 | 0.169 | <b>0.219</b> | 0.279 | 123 | 0.169 | <b>0.219</b> | 0.279 | 123 | 0.169 | <b>0.219</b> | 0.279 |
| 11  | 137 | 0.155 | <b>0.205</b> | 0.265 | 137 | 0.155 | <b>0.205</b> | 0.265 | 137 | 0.155 | <b>0.205</b> | 0.265 |
| 15  | 153 | 0.152 | <b>0.202</b> | 0.262 | 153 | 0.152 | <b>0.202</b> | 0.262 | 153 | 0.152 | <b>0.202</b> | 0.262 |
| 23  | 158 | 0.149 | <b>0.199</b> | 0.259 | 158 | 0.149 | <b>0.199</b> | 0.259 | 158 | 0.149 | <b>0.199</b> | 0.259 |
| 75  | 162 | 0.148 | <b>0.198</b> | 0.258 | 162 | 0.148 | <b>0.198</b> | 0.258 | 162 | 0.148 | <b>0.198</b> | 0.258 |
| 108 | 164 | 0.149 | <b>0.199</b> | 0.259 | 164 | 0.149 | <b>0.199</b> | 0.259 | 164 | 0.149 | <b>0.199</b> | 0.259 |
| 187 | 157 | 0.142 | <b>0.192</b> | 0.252 | 157 | 0.142 | <b>0.192</b> | 0.252 | 157 | 0.142 | <b>0.192</b> | 0.252 |
| 241 | 154 | 0.138 | <b>0.188</b> | 0.248 | 154 | 0.138 | <b>0.188</b> | 0.248 | 154 | 0.138 | <b>0.188</b> | 0.248 |

Only include "other" if MethodUnknownSex is other

Summary Statistics (without confidence intervals):

|                                      | Males | Females | Other  |
|--------------------------------------|-------|---------|--------|
| <b><math>R_0</math></b>              | 0.231 | 0.034   | -0.235 |
| <b>Lambda (<math>\lambda</math>)</b> | 1.04  | 1.025   | 0.866  |
| <b><math>r</math></b>                | 0.04  | 0.025   | -0.134 |
| <b><math>T</math></b>                | 45    | 37      | 12     |
| <b>Neonatal Mortality</b>            | 0.15  | 0.10    | 0.34   |

NNeonateDied /  
NNeonateBorn

If user selects to show confidence intervals, show this table:

Summary statistics with upper and lower X% Confidence Intervals (  $CI_L$  – **mean** –  $CI_U$  )

|                                      | Males                         | Females                       | Other                           |
|--------------------------------------|-------------------------------|-------------------------------|---------------------------------|
| <b><math>R_0</math></b>              | 0.102 - <b>0.231</b> - 0.343  | 0.202 - <b>0.340</b> - 0.578  | -0.357 - <b>-0.235</b> - -0.105 |
| <b>Lambda (<math>\lambda</math>)</b> | 0.967 - <b>1.04</b> - 1.078   | 0.923 - <b>1.025</b> - 1.033  | 0.678 - <b>0.866</b> - 0.945    |
| <b><math>r</math></b>                | -0.033 - <b>0.040</b> - 0.075 | -0.074 - <b>0.025</b> - 0.032 | -0.234 - <b>-0.134</b> - 0.056  |
| <b><math>T</math></b>                | 32 - <b>45</b> - 55           | 26 - <b>37</b> - 47           | 2 - <b>12</b> - 24              |
| <b>Neonatal Mortality</b>            | 0.07 - <b>0.15</b> - 0.27     | 0.056 - <b>0.102</b> - 0.25   | 0.014 - <b>0.342</b> - 0.567    |

If user selects Definitions add the following:

Definitions:

RiskQ<sub>x</sub>: number of animals alive on that age

RiskM<sub>x</sub>: number of animals having reproductive opportunities that age

Q<sub>x</sub> = proportion of animals that died due to non-management deaths on that age

MQ<sub>x</sub> = proportion of animals that were euthanized that age

EXPORT<sub>x</sub> = proportion of animals that age that were exported from the geographic area for this analysis

LTF<sub>x</sub> = proportion of animals that age that were lost track of

IN<sub>x</sub> = proportion of animals that age that were imported into the geographic area for this analysis

M<sub>x</sub> = Fecundity Rate: the average number of same-sexed young born to animals of age x.

Then, depending on the user selection options:

if user selected to assign real sex (BirthSexRatio) add:

“M<sub>x</sub> has been calculated by counting the actual number of male and female offspring produced by parents: male offspring only contribute to the Male M<sub>x</sub> values, female offspring to the female M<sub>x</sub> value. “

if the user selected to assign each sex 50% male, 50% female add:

“M<sub>x</sub> has been calculated by assuming each birth contributes ½ a male and ½ a female to the sum of animals born to males of the sire’s age and females of the dam’s age. “

Follow this with:

“Offspring of unknown sex are treated as 50% male, 50% female. M<sub>x</sub> is then the sum of births to parents of age x divided by the number of males and females at risk of giving birth on that age. “

If the user has decided to base fecundity on reproductive opportunity, add:

“Animals are considered at risk only if they are in a reproductive environment (e.g., a non-contracepted female in an enclosure with a breeding aged male). “

Follow this with:

“The fecundity rates provide information on the age of first, last, and maximum reproduction.”

Conditional definitions depending on user selection:

If TrackEvents includes only mortality event types: then Q’<sub>x</sub> should not be shown, and P<sub>x</sub>, L<sub>x</sub>, E<sub>x</sub>, V<sub>x</sub> labeled as follows:

- $P_x$  = proportion of animals that age that survive until the next age shown
- $L_x$  = proportion of animals that survive from birth to this age
- $E_x$  = average number of days of future life for animal of age  $x$
- $V_x$  = average number of future offspring expected for animal of age  $x$  while it remains in the population

If TrackEvents includes non-mortality event types (imports, exports, LTF), then the  $Q_x$ ,  $P_x$ ,  $L_x$ ,  $E_x$  and  $V_x$  should be labeled with the apostrophes ( $Q'_x$ ,  $P'_x$ ,  $L'_x$ ,  $E'_x$  and  $V'_x$ ) and defined as follows:

### DO THESE DEFINITIONS MAKE SENSE?

- $Q'_x$  = proportional decline in number of animals that has been observed at this age (negative  $Q'_x$  indicates an increase)
- $P'_x$  = proportional increase in number of animals that has been observed at this age
- $L'_x$  = proportion of animals reaching this age relative to number born
- $E'_x$  = average expected number of days remaining in the population for animal of age  $x$
- $V'_x$  = average number of future expected offspring for animal of age  $x$  while it remains in the population
- 

$R_0$ : Net Reproductive Rate - Growth rate of the population per generation. If each animal were to replace itself each generation, the net reproductive rate would be 1.00 and the population would remain the same size. A growing population has an  $R_0$  greater than 1.0 and a declining population less than 1.0.

Lambda ( $\lambda$ ): Growth Rate per Year - percent growth rate per year if animals consistently live and reproduce at the rates shown in the fecundity and survival tables. A year growth rate of 1.11 means a 11% per year increase.

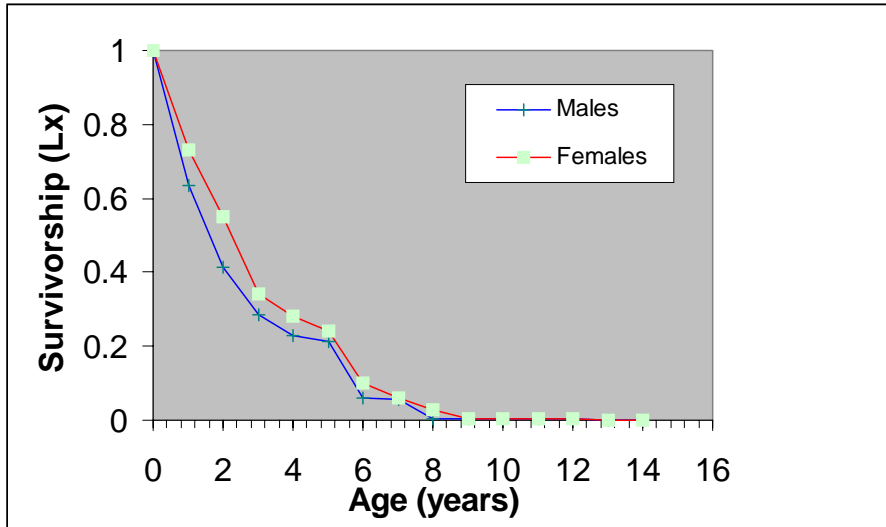
$r$ : Intrinsic Rate of Increase - the exponential rate at which a population with a stable age distribution grows.

$T$ : Generation Length - defined as the average age at which a female (or male) produces offspring. It is not the age of first reproduction. Males and females often have different generation lengths.

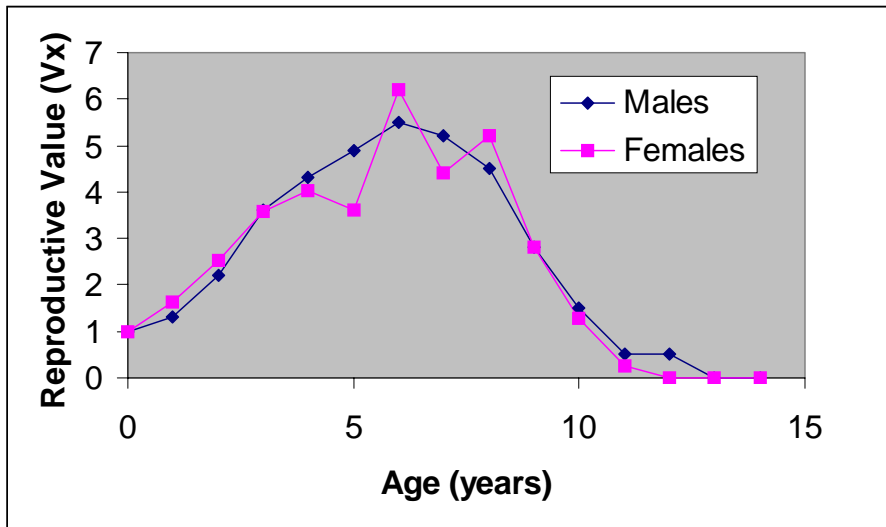
Example of graph formats:

A. For variables bounded by 0 and 1.0:

When user wants to include confidence intervals, add those above and below mean. User choice to display males with females (and maybe "others", or just one sex with confidence intervals.



B. For variables bounded only by 0:



Same applies here with confidence intervals. User clicks on which sex to include in graph, and if use or not sue confidence intervals. Copy and paste ability on all graphs.