

## TOPIC: POPULATION DEMOGRAPHY

### Population Demography

- ◆ **Demography:** the \_\_\_\_\_ analysis of population characteristics and trends.
  - Demographic information can be summarized in \_\_\_\_\_ **Tables** and **Survivorship** \_\_\_\_\_.

### Life Tables

- ◆ **Life Table:** shows a population's survivorship and mortality/reproductive rates of a \_\_\_\_\_.
  - **Cohort:** a \_\_\_\_\_ of same species individuals born into a population around the \_\_\_\_\_ time.
- ◆ Life tables *often* only include \_\_\_\_\_ since only females produce offspring.



Example of Life Table for Female Fruit flies (*Drosophila melanogaster*)\*:

Age interval (days)	Number Alive at start of interval	Survivorship at start of interval	Mortality Rate	Fecundity (avg. # of female offspring per female)
0-10	500	1.000	_____	91.7
10-20	366	0.732	0.235	146.2
20-30	280	_____	0.557	155.9
30-40	_____	0.248	0.694	161.2
40-50	38	0.076	1.000	142.3

\*Data is fabricated for the purpose of this lesson.

### PRACTICE

Which of the following statements about life tables is true?

- a) Life tables usually only consider males in the population because they typically survive the longest.
- b) Life tables provide detailed information on a population's birth & death rates but not survivorship data.
- c) Life tables can be used to estimate future population size by examining age-specific mortality/fecundity rates.
- d) Life tables never include data on males in the population.
- e) Life tables are exclusively used for studying human populations and are not applicable to other species.

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### PRACTICE

Example Life Table for female European Hedgehogs (*Erinaceus eurapeus*) in a forest in southern Wales\*:

Age group (year)	Number Alive at start of year	Survivorship at start of year	Fecundity (avg. # of offspring produced per female per year)
0-1	1,000	1.000	0.00
1-2	689	0.689	7.47
2-3	353	0.353	9.79
3-4	201	0.201	8.97
4-5	110	0.110	9.61
5-6	48	0.048	8.39

\*Data is fabricated for the purpose of this lesson – does not represent actual European Hedgehog statistics.

Based on the data in this life table, at what age do female European hedgehogs reach sexual maturity and become capable of sexual reproduction?

- a) 0-1 years.                      c) 2-3 years.  
b) 1-2 years.                      d) 3-4 years.



### PRACTICE

If a cohort of female European Hedgehogs has a starting population of 2,500 and a survivorship of 0.353 after 2 years, how many hedgehogs make it to 2 years old?

- a) 883.                                  c) 1723.  
b) 503.                                  d) 353.

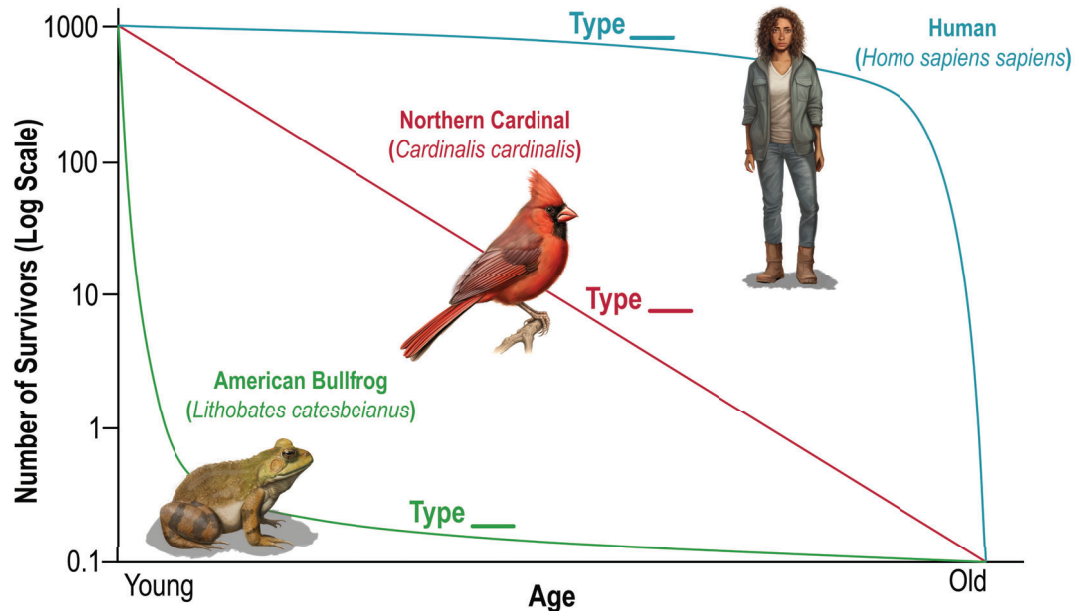
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### Survivorship Curves

◆ **Survivorship Curve:** a graph of # of *living individuals* in a cohort (Y-axis) \_\_\_\_\_ to each *age* (X-axis).

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◆ There are \_\_\_\_\_ general shapes of survivorship curves (Types I, II, and III):



NOTE: Survivorship is a spectrum & most populations exhibit characteristics that fall in between these 3 types.

### EXAMPLE

Which of the following species exhibit a type II survivorship curve?

1. Oak trees - produce thousands of acorns, very few of which grow into mature oak trees.
2. Rats – do not have a significantly higher death rate at any specific age.
3. Humans living in the USA.
4. Frogs – produce hundreds of tadpoles, most of whom cannot avoid predation or starvation.
5. Wrens – small songbirds that have approximately an equal chance at dying throughout their lifespan.

a) 1, 3, & 5.

c) 4 & 5.

b) 2 only.

d) 2 & 5.

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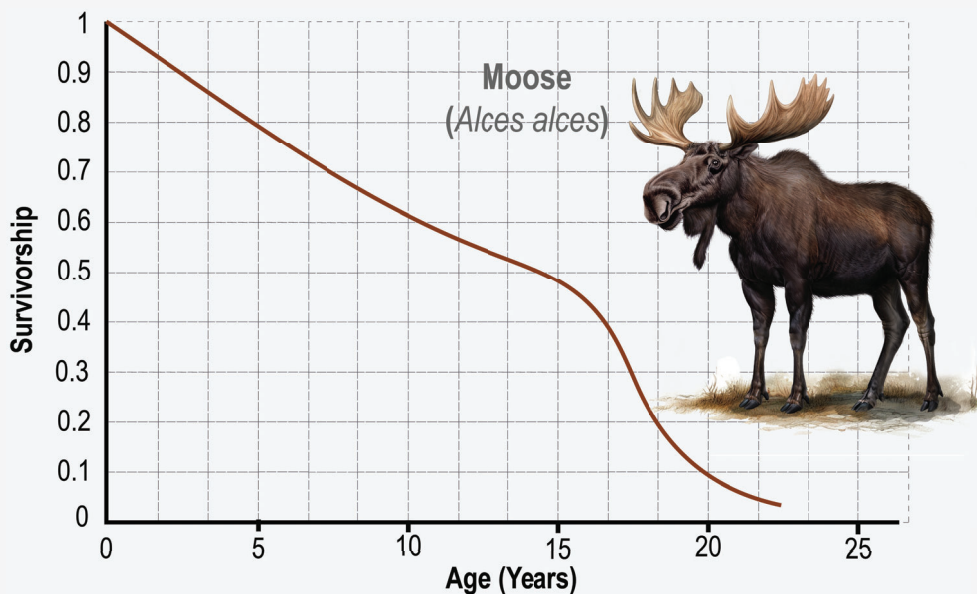
### PRACTICE

A carp has many offspring at once, but the majority of them are eaten by predators in their first year of life. As carp develop & grow, they have fewer predators in later life. Which survivorship curve do carp exhibit?

- a) Type I.
- b) Type II.
- c) Type III.
- d) Impossible to tell.

### PRACTICE

Based on the following survivorship curve for moose, how many moose in an initial cohort of 3,500 individuals would you expect to survive to age 20?



- a) 100 moose.
- b) 350 moose.
- c) 35 moose.
- d) Impossible to tell.