

3.3 Survivorship Curves

Name: _____ Class: _____ Date: _____

Total: 9 marks

KEY WORDS survivorship curve 存活曲线

Objective

Build the skills to answer exam questions on **survivorship curves**.

You must be able to:

- describe **Type I, II, and III** 存活曲线 survivorship curves
- match each to a reproductive strategy
- read a survivorship curve

1 Worked examples

Study these first. Each one shows the method for a question type used later — follow the steps and you can do the Practice and Exam-style questions yourself.

■ The three curves

A **survivorship curve** plots the fraction surviving against age:

- **Type I** — high survival when young, most deaths in **old age** (large mammals, humans). K-selected.
- **Type II** — a **constant** death rate at all ages (many birds, rodents) — a straight diagonal line.
- **Type III** — very high death rate when young, few survive to adulthood (fish, insects, plants). r-selected.

■ Matching to strategy

Type III goes with **r-selected** species (many offspring, little care); **Type I** with **K-selected** species (few offspring, much care).

■ Reading a curve

A curve that stays high then drops steeply at the end is **Type I**; one that drops steeply at the start is **Type III**; a straight line is **Type II**.

■ A worked match

A sea turtle laying hundreds of eggs, most eaten young, shows a **Type III** curve.

2 Practice

Now apply the methods above.

2.1 Which survivorship type has most deaths in old age? [1]

2.2 Which type has a constant death rate at all ages? [1]

2.3 Which type matches r-selected species? [1]

3 Exam-style questions

3.1 A Type III survivorship curve shows [1]

- **A** most deaths in old age
- **B** a constant death rate
- **C** very high death rates when young
- **D** no deaths

3.2 A fish species lays thousands of eggs, and very few survive to adulthood.

(a) State the survivorship curve type. [1]

(b) Explain how this matches its reproductive strategy. [2]

3.3 Explain why humans show a Type I survivorship curve. [2]

Solutions

2.1 Type I.

2.2 Type II.

2.3 Type III.

3.1 C — very high death rates when young.

3.2 (a) Type III. (b) It is r-selected — producing many offspring with little care, so most die young, giving a steep early drop.

3.3 Humans (K-selected) produce few offspring with much care, so most survive to old age and deaths cluster late in life, giving a Type I curve.