Measuring population size using the Lincoln Index (capture-mark-recapture)

The Lincoln Index allows conservationists to estimate population sizes of individual animal species. Individuals are captured, marked, released back into the population and recaptured. Results are then put into an equation to give a population estimate.

The equation is as follows:

$$\text{Total Population (N)} = \frac{\text{Number of individuals first marked and released (n1)} \times \text{Number of animals captured in second sample (n2)}}{\text{Number of marked animals in second sample (n3)}}$$

Estimating population size of woodlice (method):

1) Students measure an area of 10m². **Note: The size of the area can be larger or smaller depending on the number of students in the class. An area of 10m² is suitable for a class of 30 students.**

2) Looking under logs etc. students collect as many woodlice they can find in five minutes. Woodlice should be collected using spoons and placed into suitable containers (e.g. margarine tubs).

3) Record the total number of woodlice collected.

4) Paint a red spot on the back of each woodlouse using non-toxic soluble paint.

5) Place woodlice back where they were found.

6) After 1-2 hours go back to the same original location and collect as many woodlice you can find in 5 minutes (marked/ unmarked).

7) Record the number of individuals captured including the number of marked woodlice recaptured.

8) Put data into the Lincoln Index equation above to estimate population size.

Assumptions:

- The population must have a finite boundary.
- The population should not alter as a result of births and deaths, or immigration or emigration to or from the population in the study area, in the study period.

Important points:

- Use non-toxic soluble paint. The paint will wash away within a few hours.
- Carefully pick up woodlice using spoons.
- Make sure all woodlice are placed back where they're found.

Unmarked Woodlice

Marked Woodlice