Introduction to Distance Sampling

Line transect Solutions

Ducknest dataset

1) \( P_a = \text{area under curve} / \text{area of rectangle}. \)

To estimate the area under the curve, I read off the heights of the mid points (in blue) of my fitted curve (red) as follows: 75, 74, 72, 70, 66, 62, 58, 53. So my estimate of area is \((75+74+72+70+66+62+58+53) \times 0.3 = 530 \times 0.3 = 159\). There are lots of other ways to work out the area under a curve – e.g., counting the number of grid squares under the curve on your graph paper or using the trapezoidal rule.

Area of rectangle is height \( \times \) width = 75\( \times \)2.4 = 180.

So, my estimate of \( P_a \) is 159/180 = 0.883.

How many nests were in the surveyed area? I saw 534 nests, and I estimate the proportion seen is 0.883, so that means I estimate there were 534/0.883=604.7 nests in the surveyed area. This estimate is for a surveyed area of \( 2wL = 2 \times (2.4/1000) \times 2575 = 12.36 \text{km}^2 \). I therefore estimate nest density as 604.7/12.36 = 48.9 nests per \( \text{km}^2 \).