

MARK-RECAPTURE EXERCISE – CALCULATIONS
(calculated population size rounded to the nearest whole number)

(1) Petersen method:

$$N = [(57 + 1)(74+1)/(15 + 1)] - 1$$

$$N = [(58*77)/16] - 1 = 271$$

(2a) Petersen method: small eggs:

$$N = [(15 + 1)(25+1)/(5 + 1)] - 1$$

$$N = [(26*16/6)] - 1 = 68$$

(2b) medium eggs:

$$N = [(27+1)(36+1)/(6+1)] - 1$$

$$N = [(28*37/6)] - 1 = 147$$

(2b) large eggs:

$$N = [(15+1)(13+1)/(4+1)] - 1$$

$$N = [(16*14/4)] - 1 = 44$$

(3) Modified Schnabel method:

$$N = [(74*57^2) + (78*116^2) + (66*154^2) + (81*187^2)] / [(15*57) + (40*116) + (33*154) + (48*187)] = 291$$

(4a) small eggs:

$$N = [(25*15^2) + (20*35^2) + (23*48^2) + (36*59^2)] / [(5*15) + (7*35) + (12*48) + (17*59)] = 110$$

(4b) medium eggs:

$$N = [(36*27^2) + (45*57^2) + (25*77^2) + (35*90^2)] / [(6*27) + (25*57) + (12*77) + (21*90)] = 137$$

(4c) large eggs:

$$N = \frac{[(13 \cdot 15^2) + (13 \cdot 24^2) + (18 \cdot 29^2) + (10 \cdot 38^2)]}{[(4 \cdot 15) + (8 \cdot 24) + (9 \cdot 29) + (10 \cdot 38)]} = 45$$

(7) Accuracy:

Petersen total: $A = \pm 100 (271-280) / 280 = 3.2$

Petersen small eggs: $A = \pm 100 (68-91) / 91 = 25.3$

Petersen medium eggs: $A = \pm 100 (147-143) / 143 = 2.8$

Petersen large eggs: $A = \pm 100 (44-46) / 46 = 4.3$

Modified Schnabel method total: $A = \pm 100 (291-280) / 280 = 3.9$

Modified Schnabel method small eggs: $A = \pm 100 (110-91) / 91 = 20.9$

Modified Schnabel method medium eggs: $A = \pm 100 (137-143) / 143 = 4.2$

Modified Schnabel method large eggs: $A = \pm 100 (45-46) / 46 = 2.2$