

Fishery Reserve Model

Region 1 – Reserve (no fishing)

Region 2 – Fishery with harvest rate $F(t) = F_{\min} + \frac{F_{\max} - F_{\min}}{2} \left(1 + \sin \frac{2\pi t}{n} \right)$

Population Dynamics

$$\frac{dB_1}{dt} = rB_1 \left(1 - \frac{B_1}{K_1} \right) + a \left(\frac{B_2}{K_2} - \frac{B_1}{K_1} \right)$$

$$\frac{dB_2}{dt} = rB_2 \left(1 - \frac{B_2}{K_2} \right) - a \left(\frac{B_2}{K_2} - \frac{B_1}{K_1} \right) - F(t)B_2$$