$$\frac{dN}{dt} = -G_{PE}\frac{N}{N+K_{PE}}PE - G_{PS}\frac{N}{N+K_{PS}}PS = 0$$

$$\frac{dPS}{dt} = G_{PS}\frac{N}{N+K_{PS}}PS - m_{PS}PS = 0$$

$$\frac{dPE}{dt} = G_{PE}\frac{N}{N+K_{PE}}PE - m_{PE}PE = 0$$

} equilibrium eqns.

1. Solve P equations independently b/c they're constant & = 0

a) $$PS\left[\left(G_{PS}\frac{N}{N+K_{PS}}\right) - m_{PS}\right] = 0$$

$P = 0$

$$G_{PS}\frac{N}{N+K_{PS}} - m_{PS} = 0$$

$$\frac{N}{N+K_{PS}} = \frac{m_{PS}}{G_{PS}}$$

$$N = \frac{m_{PS}}{G_{PS}}N + \frac{m_{PS}}{G_{PS}}K_{PS}$$

$$N\left(1 - \frac{m_{PS}}{G_{PS}}\right) = \frac{m_{PS}}{G_{PS}}K_{PS}$$

$$N = \frac{\frac{m_{PS}}{G_{PS}}K_{PS}}{\left(1 - \frac{m_{PS}}{G_{PS}}\right)}$$

Attenuation coefficient

↳ $K_{PS} = 0.05\ m$

$G_{PS} = 52.5\ day^{-1}$

$m_{PS} = 0.1\ day^{-1}$

N^* bigger = loses

b) $PE\left[\left(G_{PE}\frac{N}{N+K_{PE}}\right)-m_{PE}\right]=0$

$PE=0$

$$G_{PE}\frac{N}{N+K_{PE}}-m_{PE}=0$$

$$\frac{N}{N+K_{PE}}=\frac{m_{PE}}{G_{PE}}$$

Attenuation coefficient

↳ $K_{PE}=0.05\ m$

$G_{PE}=2.5\ day^{-1}$

$m_{PE}=0.1\ day^{-1}$

$$N=\frac{m_{PE}}{G_{PE}}N+\frac{m_{PE}}{G_{PE}}K_{PE}$$

$$N\left(1-\frac{m_{PE}}{G_{PE}}\right)=\frac{m_{PE}}{G_{PE}}K_{PE}$$

$$N=\frac{\frac{m_{PE}}{G_{PE}}K_{PE}}{\left(1-\frac{m_{PE}}{G_{PE}}\right)}$$