BauchModel_2

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2022-11-08

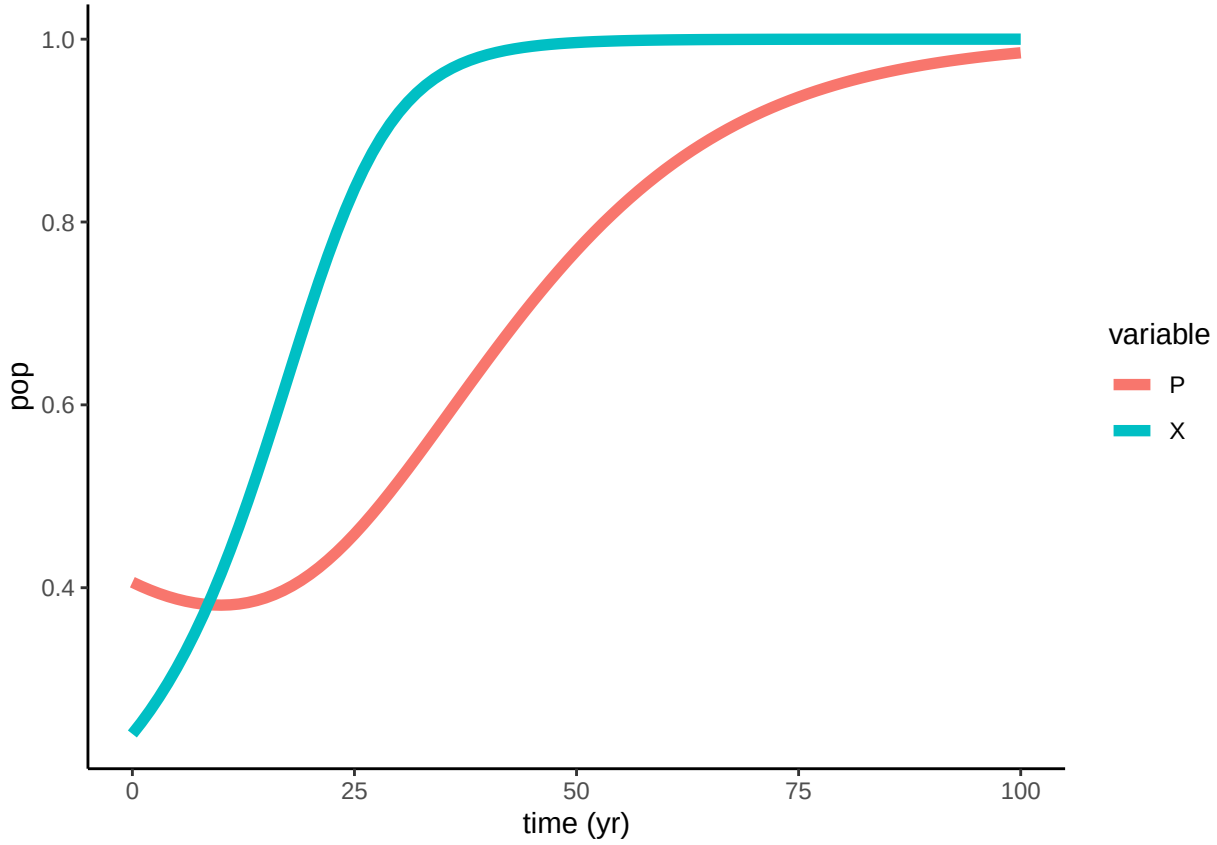

Figure 1: Original Bauch Model

See derivation in notes but this is the new equations (still unsure about interaction terms):

$\frac{dP_1}{dt} = r_1 P_1(1-P_1) - \frac{h_1 * P_1(1-X_1)}{P_1+s_1} + \rho_1 * \frac{P_2-P_1}{2}$

$\frac{dX_1}{dt} = k_1 X_1(prop_1 - X_1)X_2(prop_2 - X_2)[\frac{1}{P_1+c_1} - w_1 + d_1(2X_1 - prop_1) + d_2(2X_2 - prop_2)]$

$\frac{dP_2}{dt} = r_2 P_2(1-P_2) - \frac{h_2 * P_2(1-X_2)}{P_2+s_2} + \rho_2 * \frac{P_1-P_2}{2}$

$\frac{dX_2}{dt} = k_1 X_1(prop_1 - X_1)X_2(prop_2 - X_2)[\frac{1}{P_2+c_2} - w_2 + d_1(2X_1 - prop_1) + d_2(2X_2 - prop_2)]$

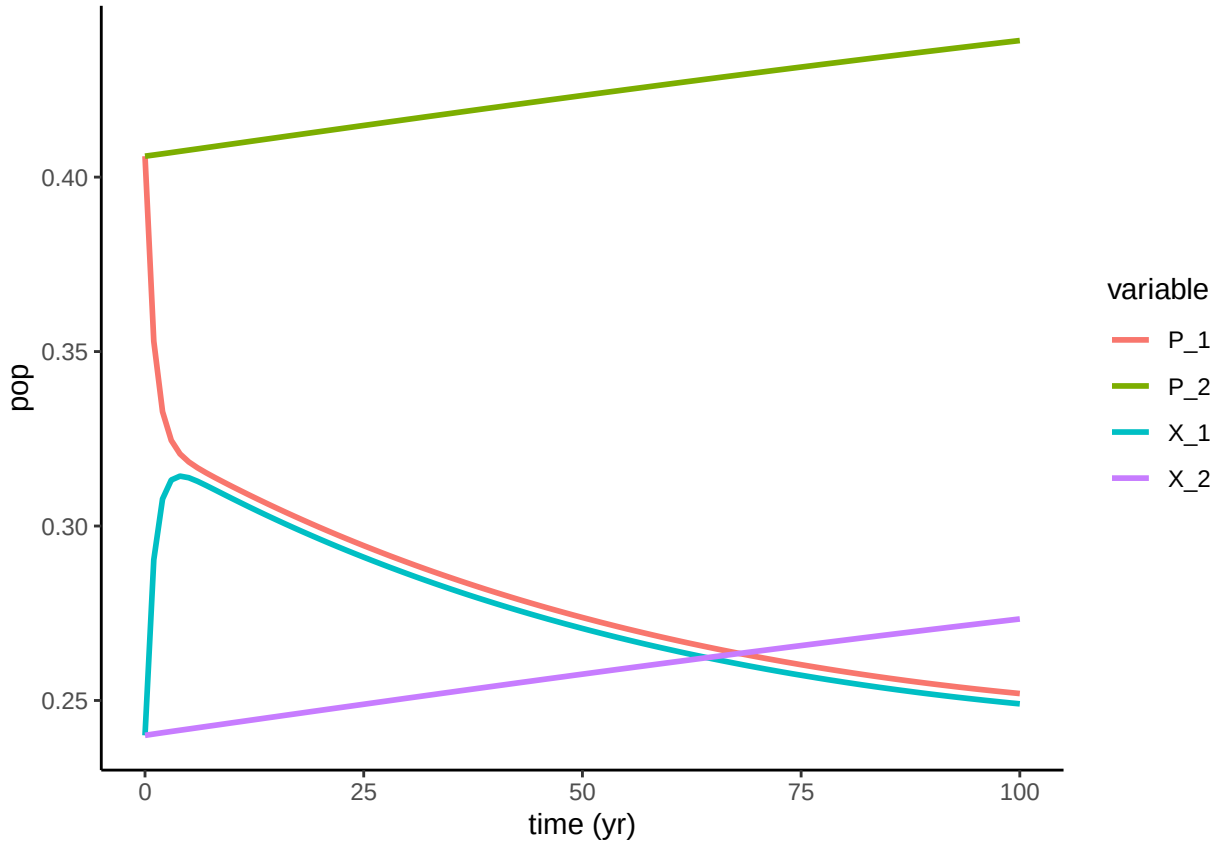

Figure 2: New Model with default paramters

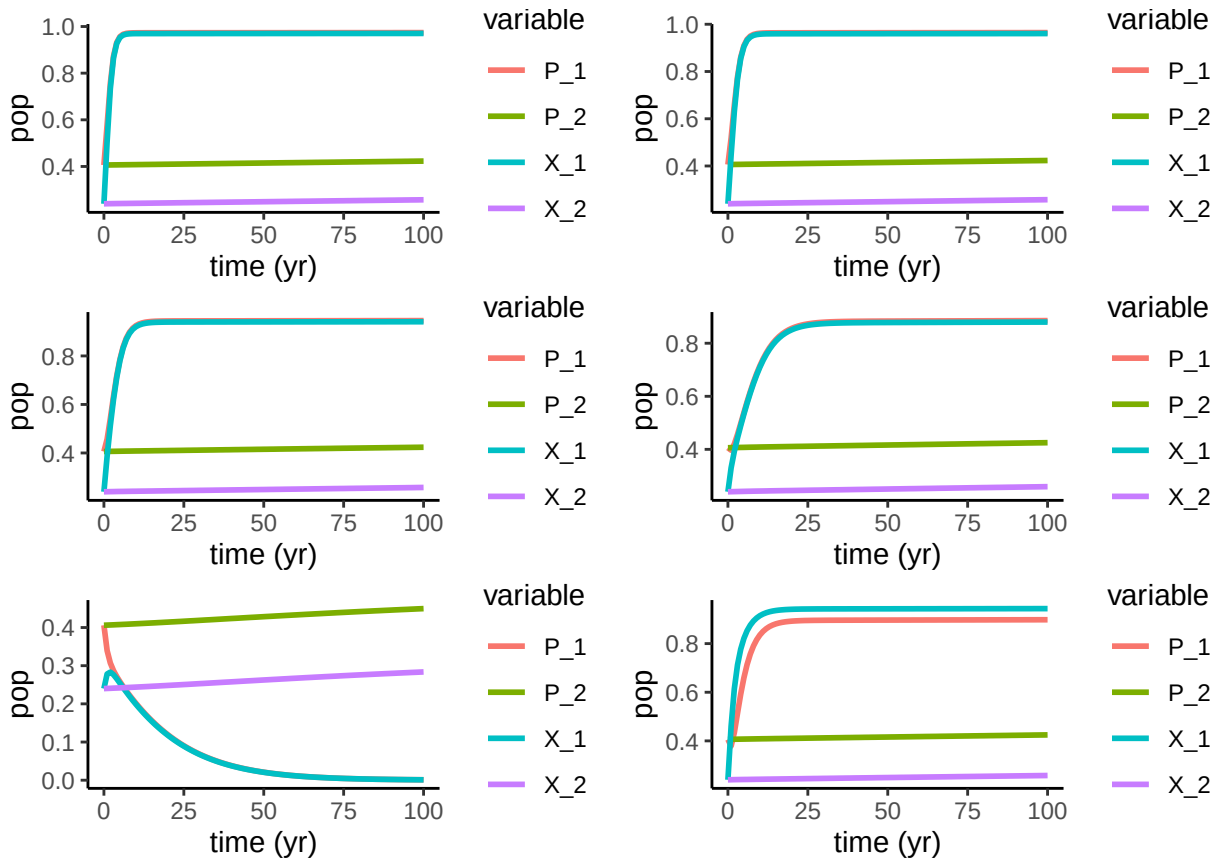

Figure 3: R - Net growth/fecundity, range 0 to 1

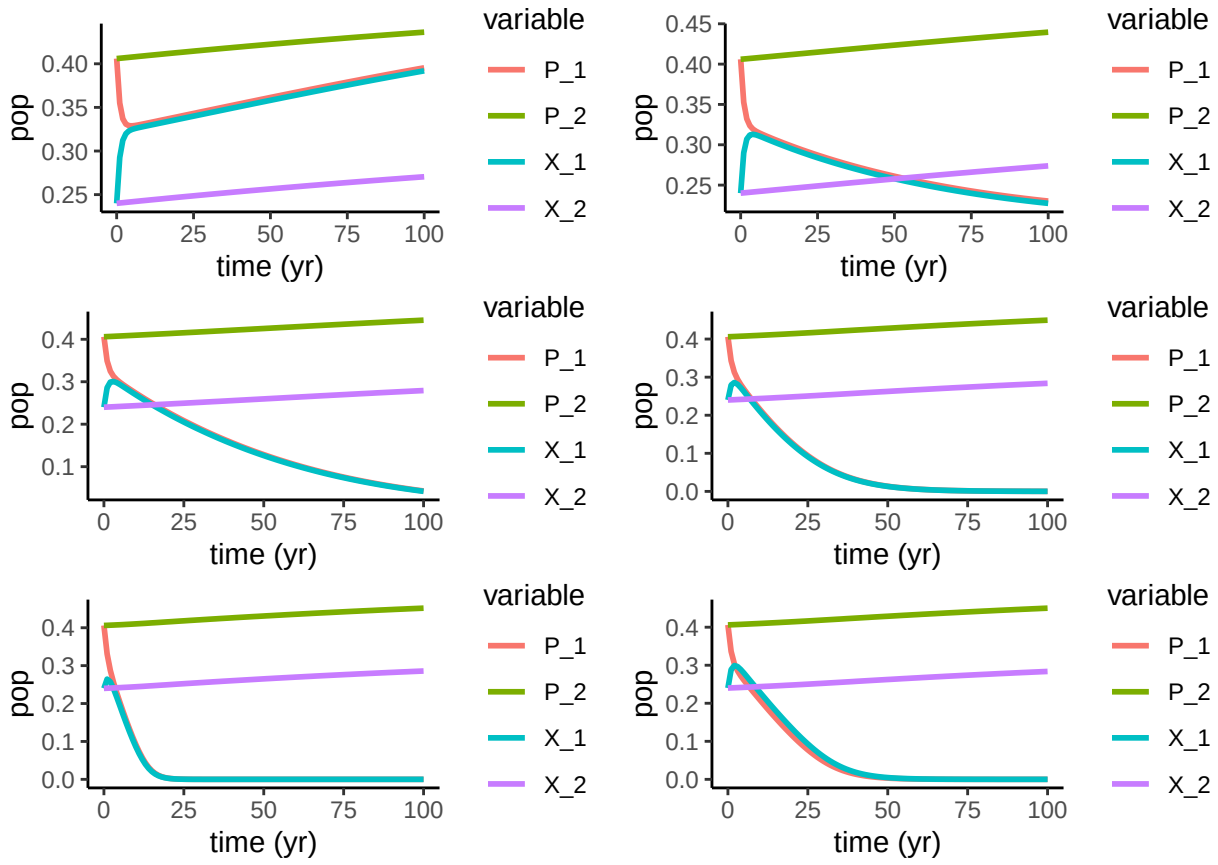

Figure 4: S - supply and demand, range 0.1 to 1

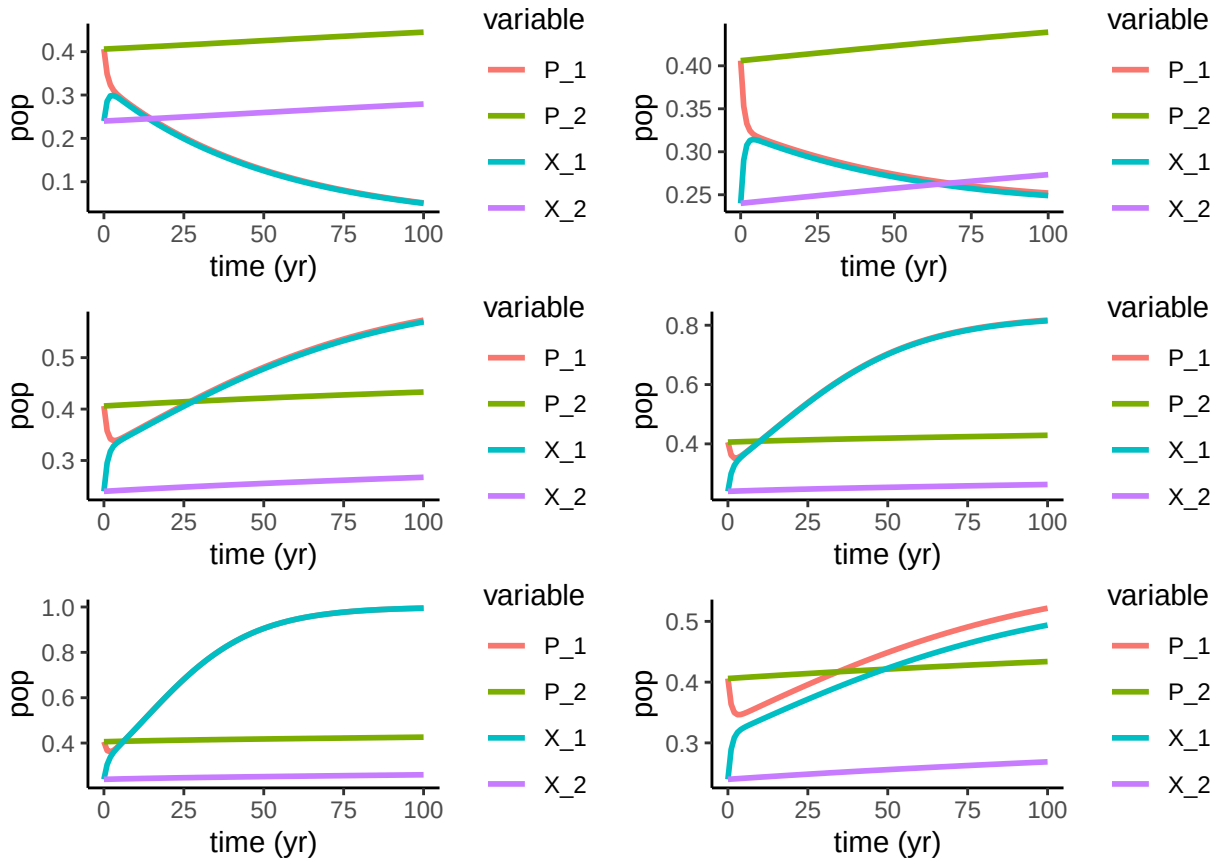

Figure 5: h - Harvesting efficiency, range 0 to 0.1. Note, default is .075

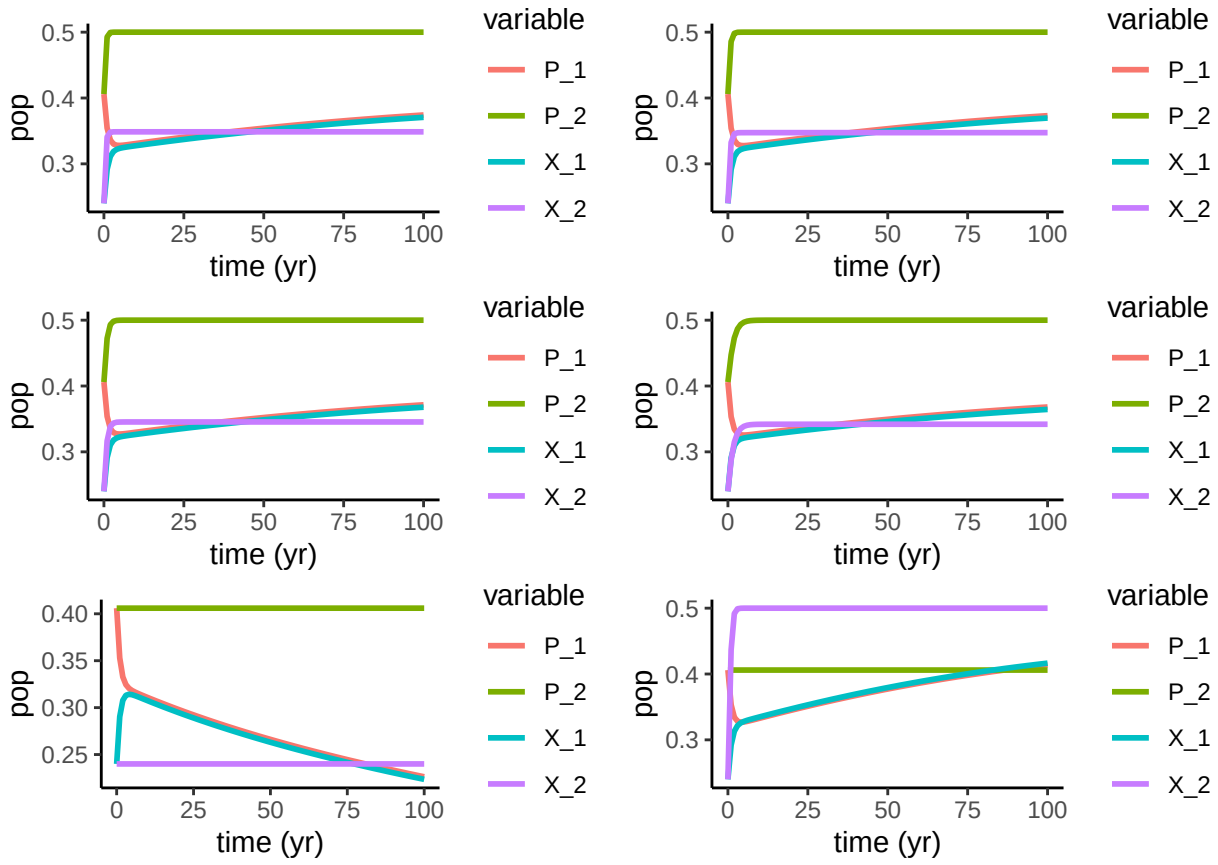

Figure 6: K - Social learning rate 0 to 100

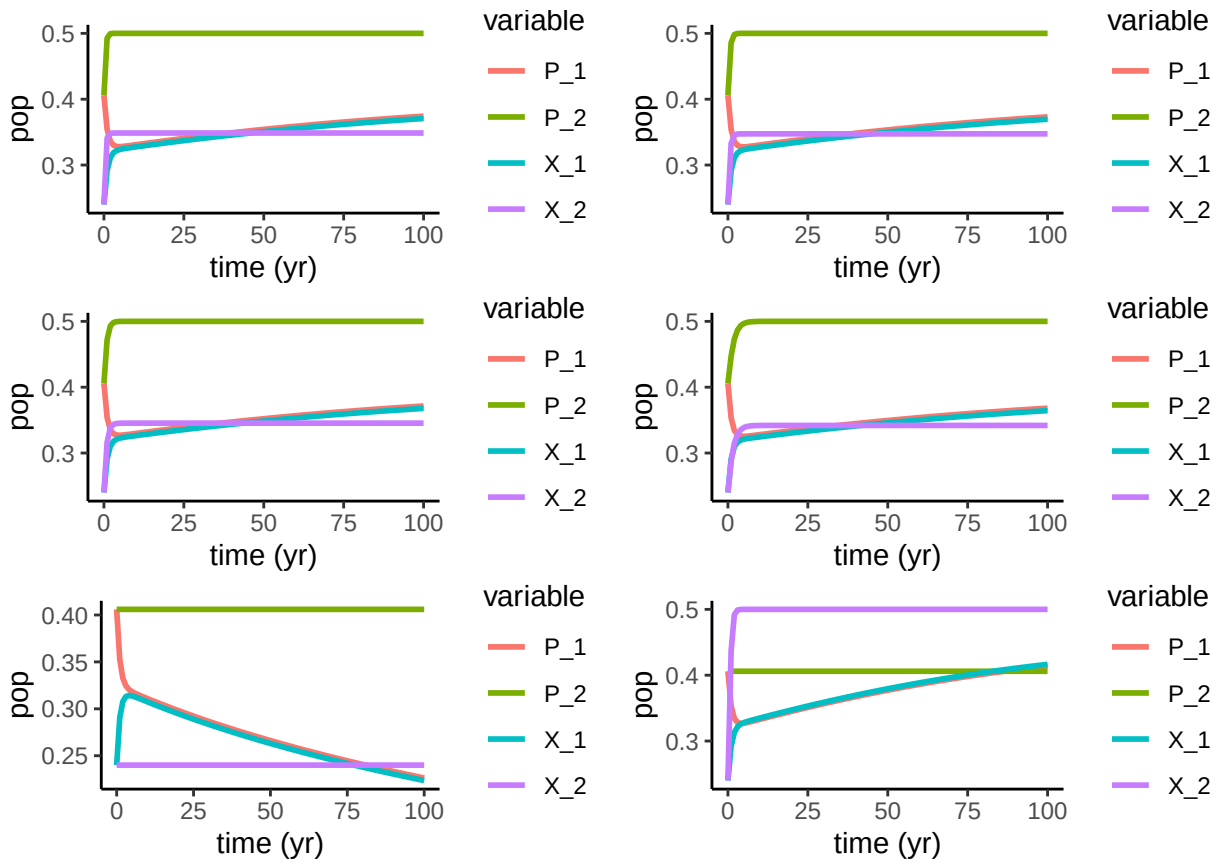

Figure 7: K - Social learning rate 0 to 100

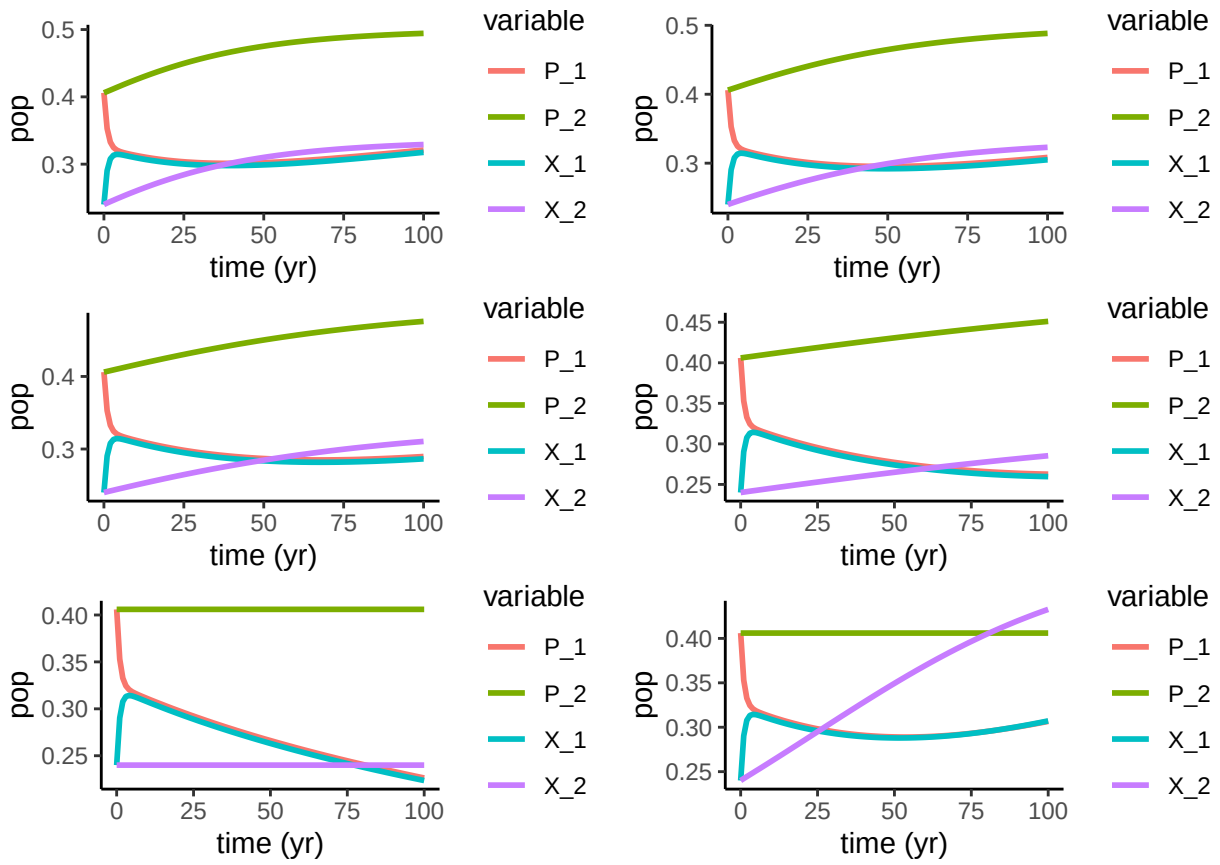

Figure 8: K - Social learning rate 0 to 1

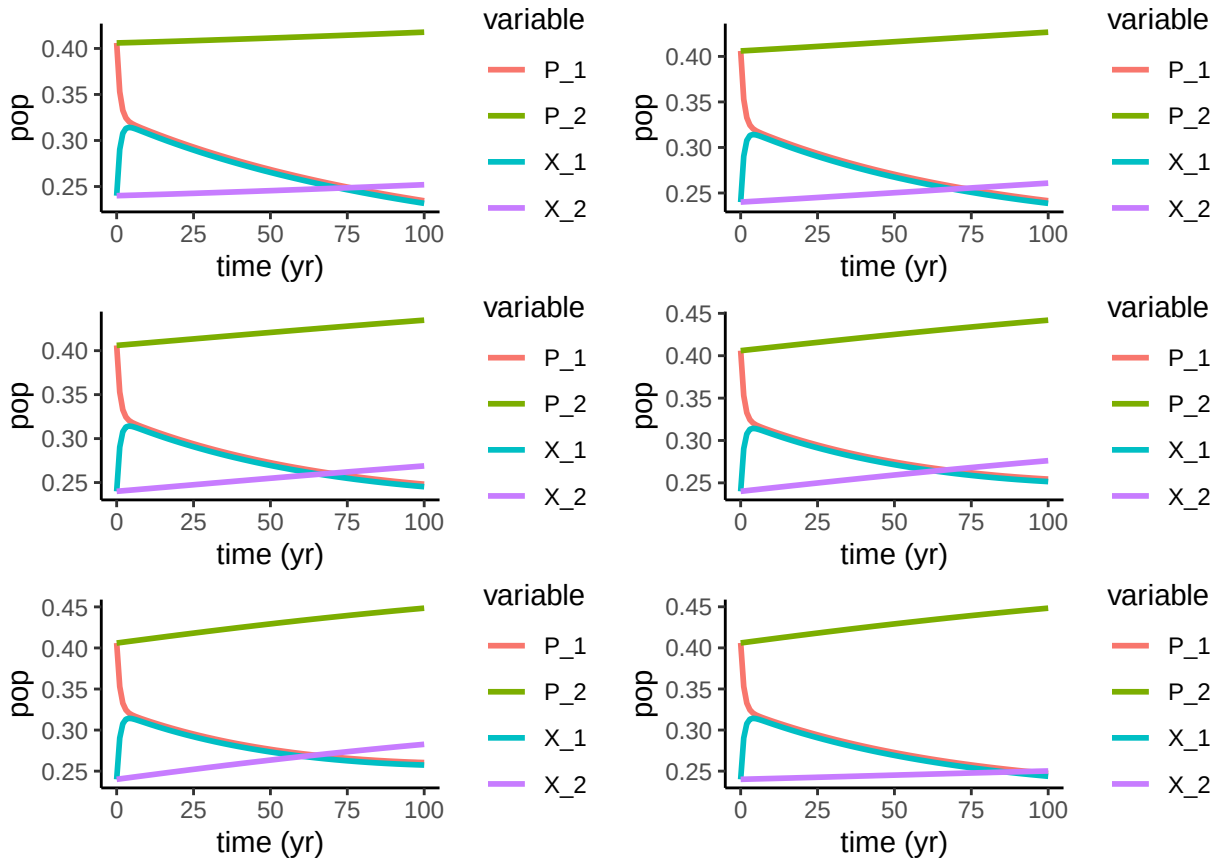

Figure 9: w - conservation costs

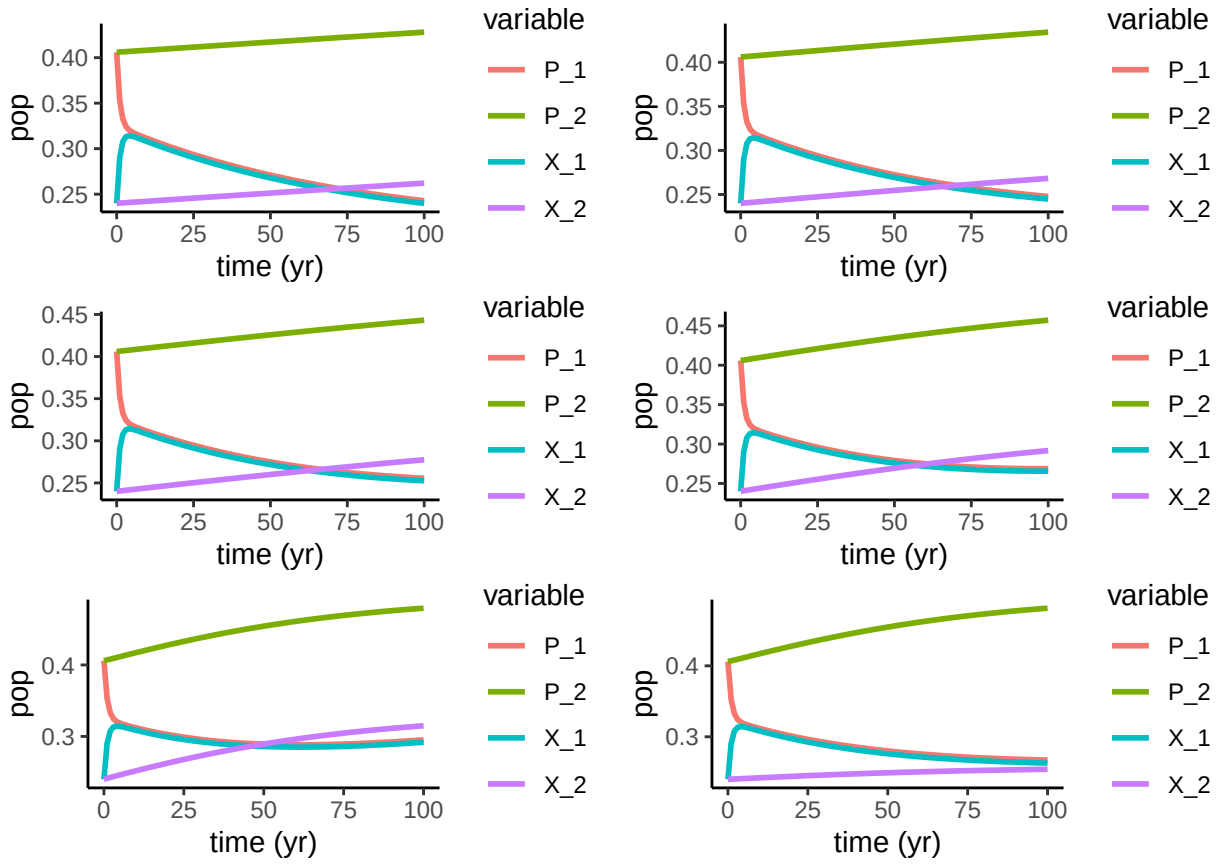

Figure 10: c - rarity valuation param

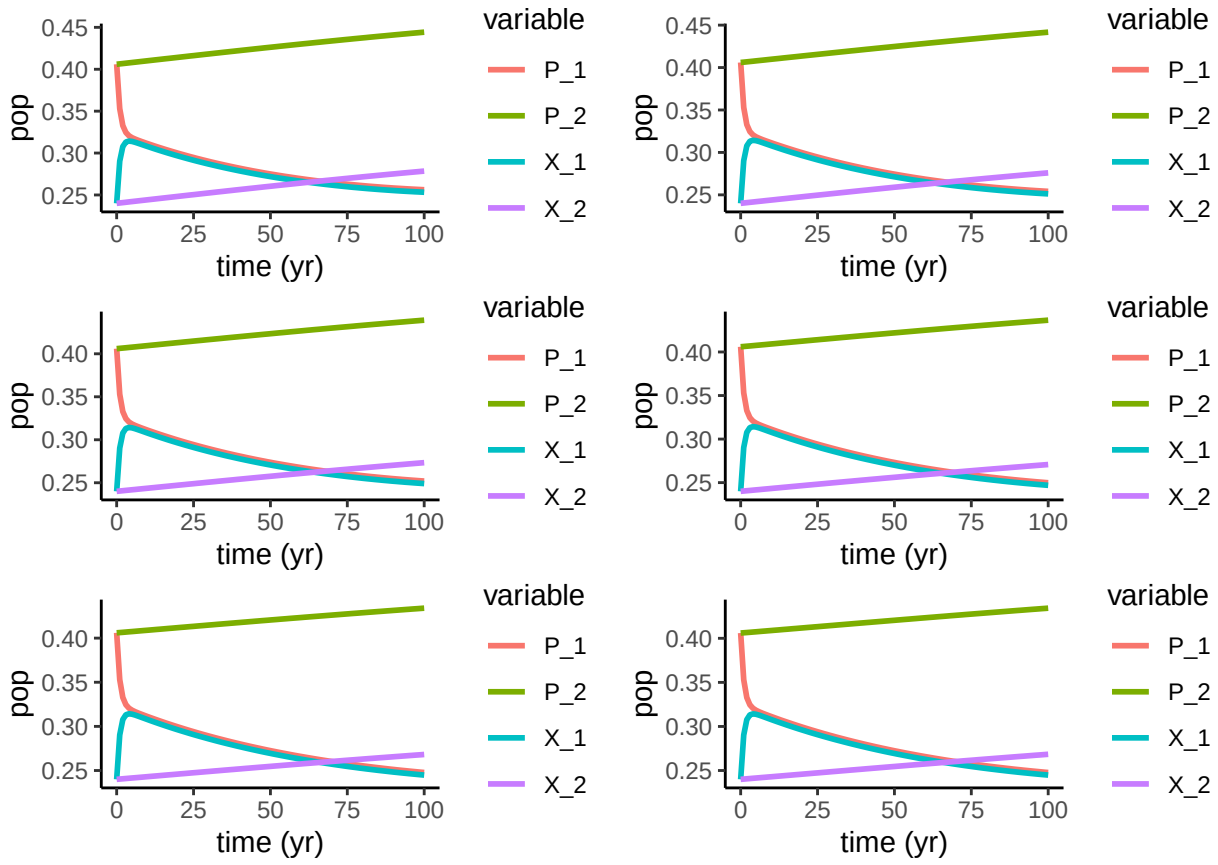

Figure 11: d - social norm strength

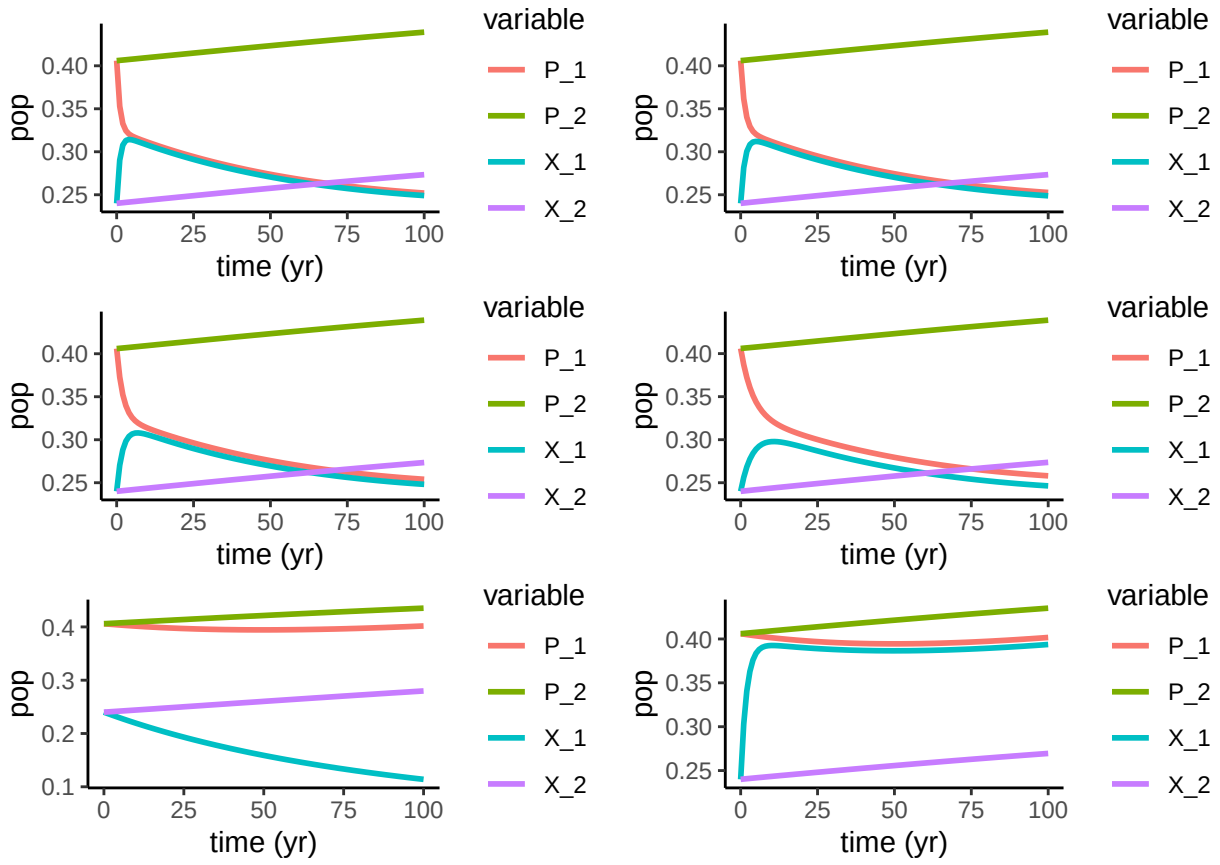

Figure 12: roe - fish diffusion