

BauchModel_DiffCostsLowInfluence

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23 March, 2023, 14:32



Figure 1: Original Bauch Model

Table 1: Parameter values used in this analysis

| Parameter | Population_1 | Population_2 | Def |
|-----------|--------------|--------------|--|
| r | 0.49 | 0.49 | Fish net growth |
| s | 0.8 | 0.8 | Supply and demand |
| h | 0.075 | 0.075 | Harvesting efficiency |
| k | 0.17 | 0.17 | Social learning rate |
| w | 0.35 | 0.75 | Conservation cost |
| c | 1.68 | 1.68 | Rarity valuation |
| d | 0.2 | 0.2 | Social norm strength (within pop) |
| e | 0.05 | 0.05 | Fish emigration (from patch) |
| i | 0.05 | 0.05 | Fish immigration (from opposite patch) |
| prop | 0.01 | 0.01 | Social norm strength (opposite pop) |

Table 2: Starting values used in this analysis

| Parameter | Population_1 | Population_2 |
|-----------|--------------|--------------|
| F | 0.406 | 0.406 |
| X | 0.240 | 0.240 |

SCENARIO: THAMPI PARAMS DIFFERENT COSTS LOW EXTERNAL INFLUENCE

Function:

$$\frac{dP_1}{dt} = r_1 P_1 (1 - P_1) - \frac{h_1 * P_1 (1 - X_1)}{P_1 + s_1} - e_1 P_1 + i_1 P_2$$

$$\frac{dP_2}{dt} = r_2 P_2 (1 - P_2) - \frac{h_2 * P_2 (1 - X_2)}{P_2 + s_2} - e_2 P_2 + i_2 P_1$$

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

$$\frac{dX_2}{dt} = k_2 X_2 (1 - X_2) \left[\frac{1}{P_2 + c_2} - w_2 + d_2 (2X_2 - 1) + prop_2 (2X_1 - 1) \right]$$

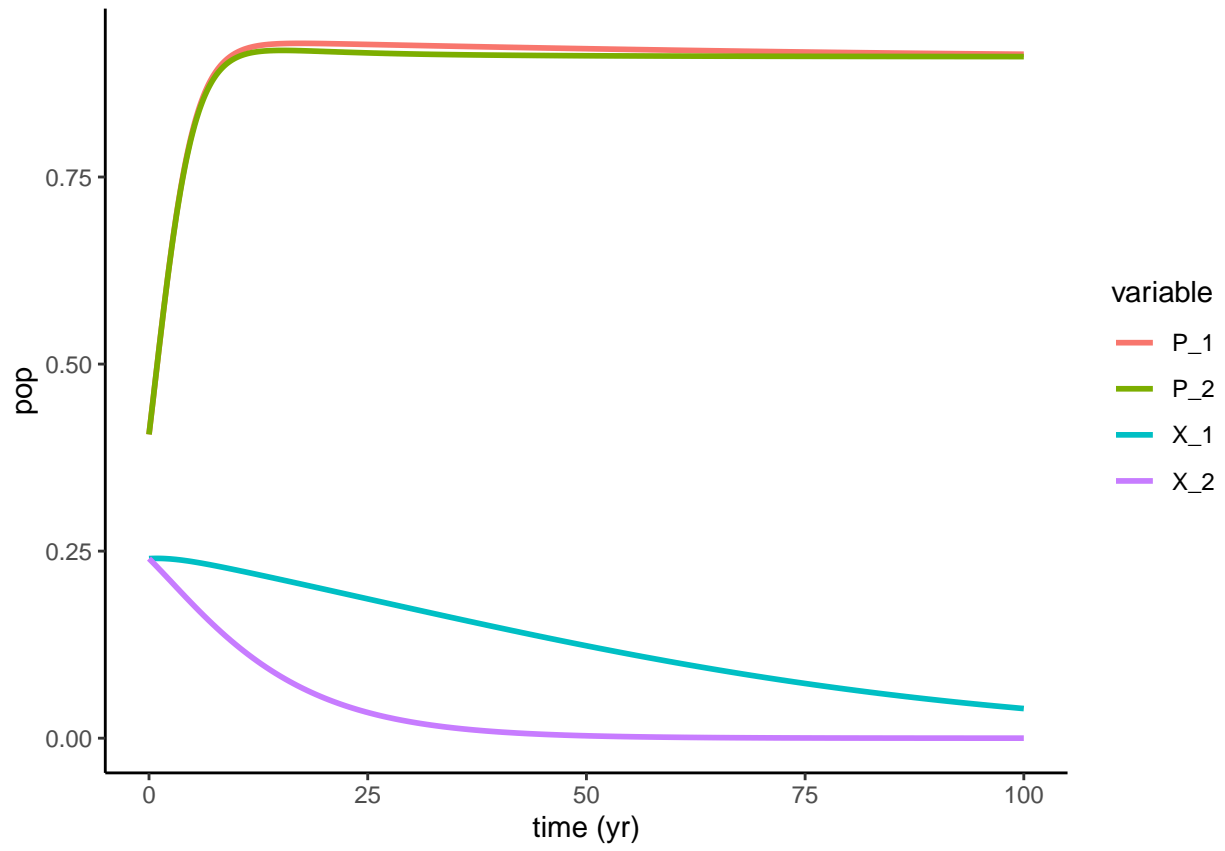


Figure 2: New Model with default paramters

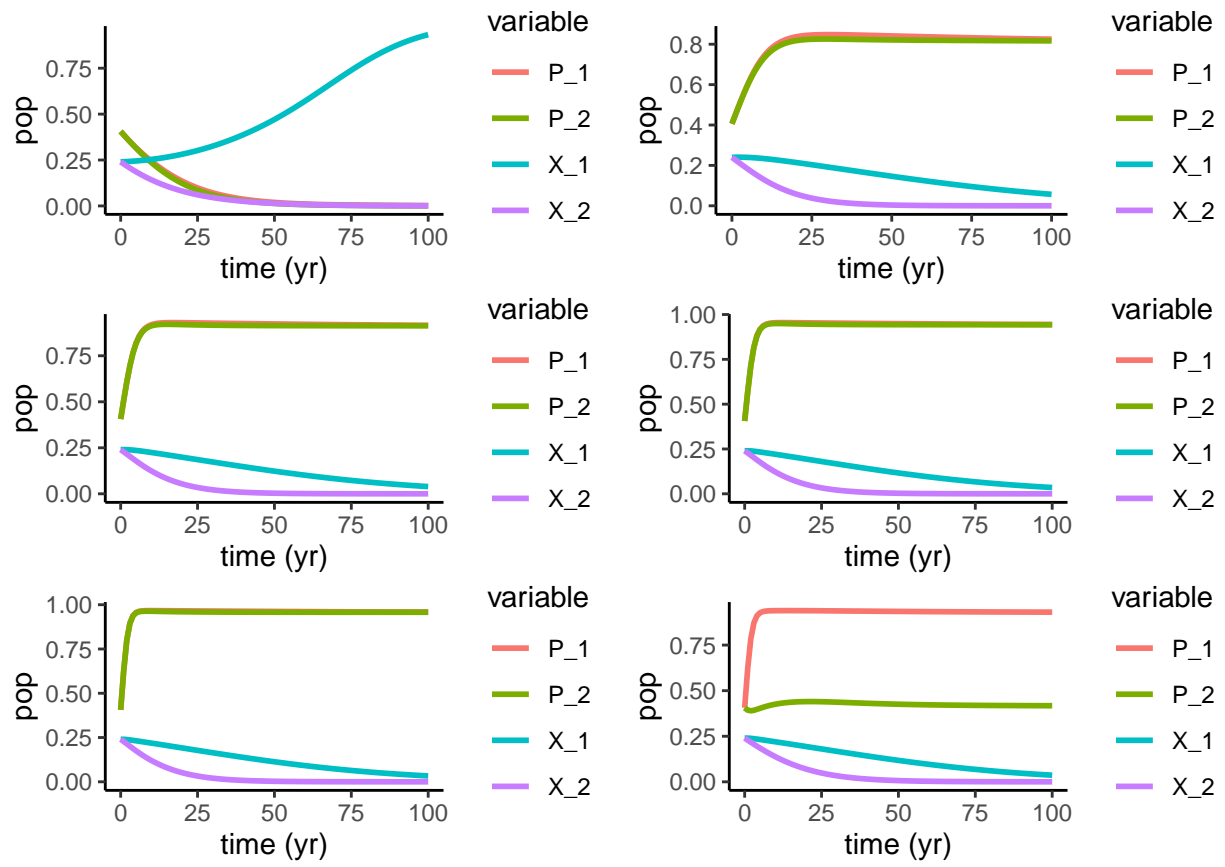


Figure 3: R - Net growth/fecundity, range 0 to 1

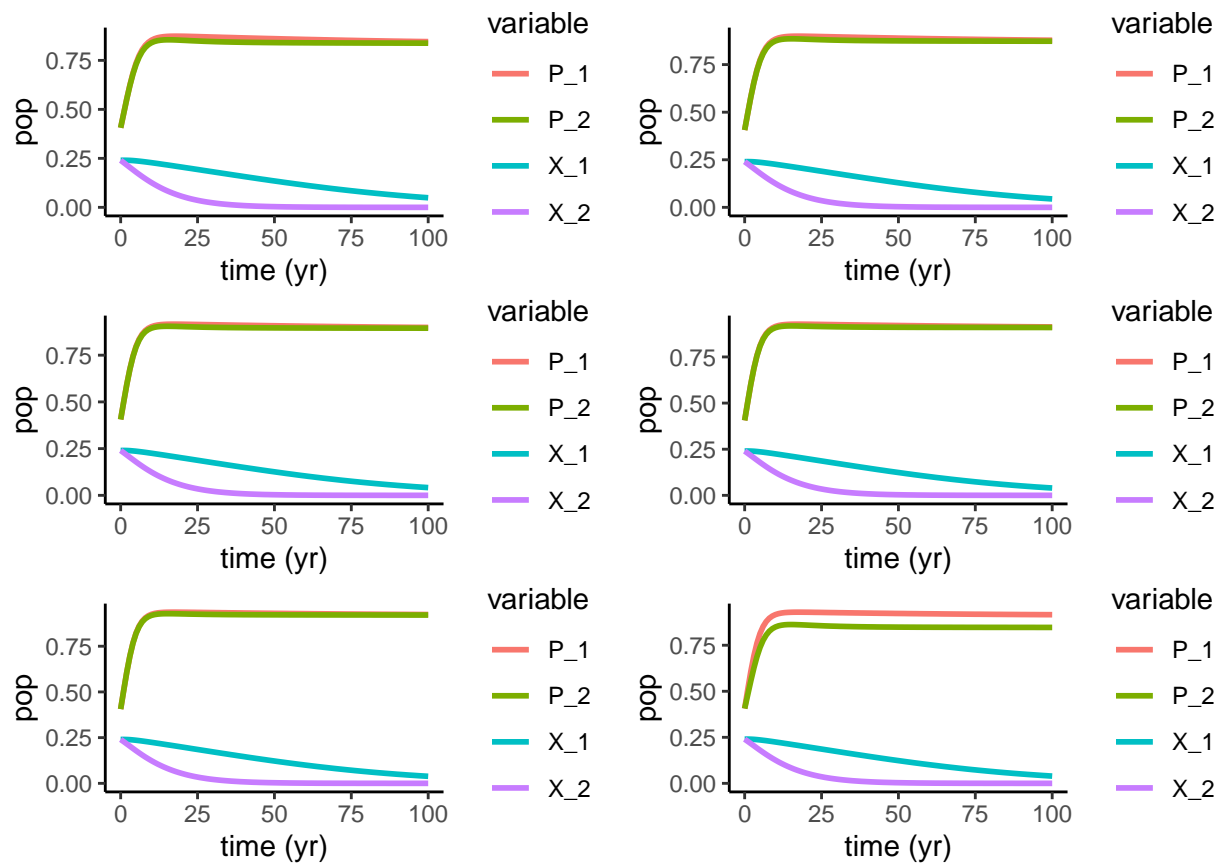


Figure 4: S - supply and demand, range 0.1 to 1

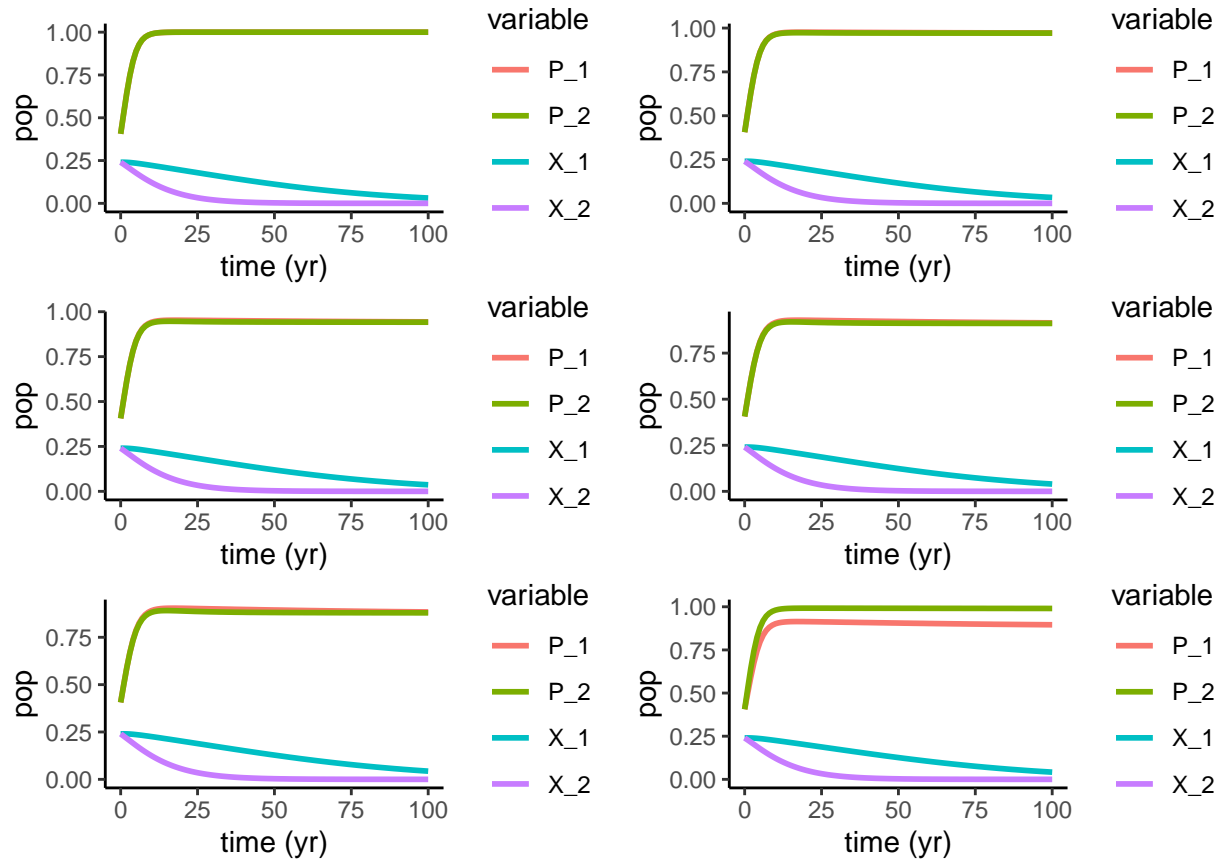


Figure 5: h - Harvesting efficiency, range 0 to 0.1. Note, default is .075

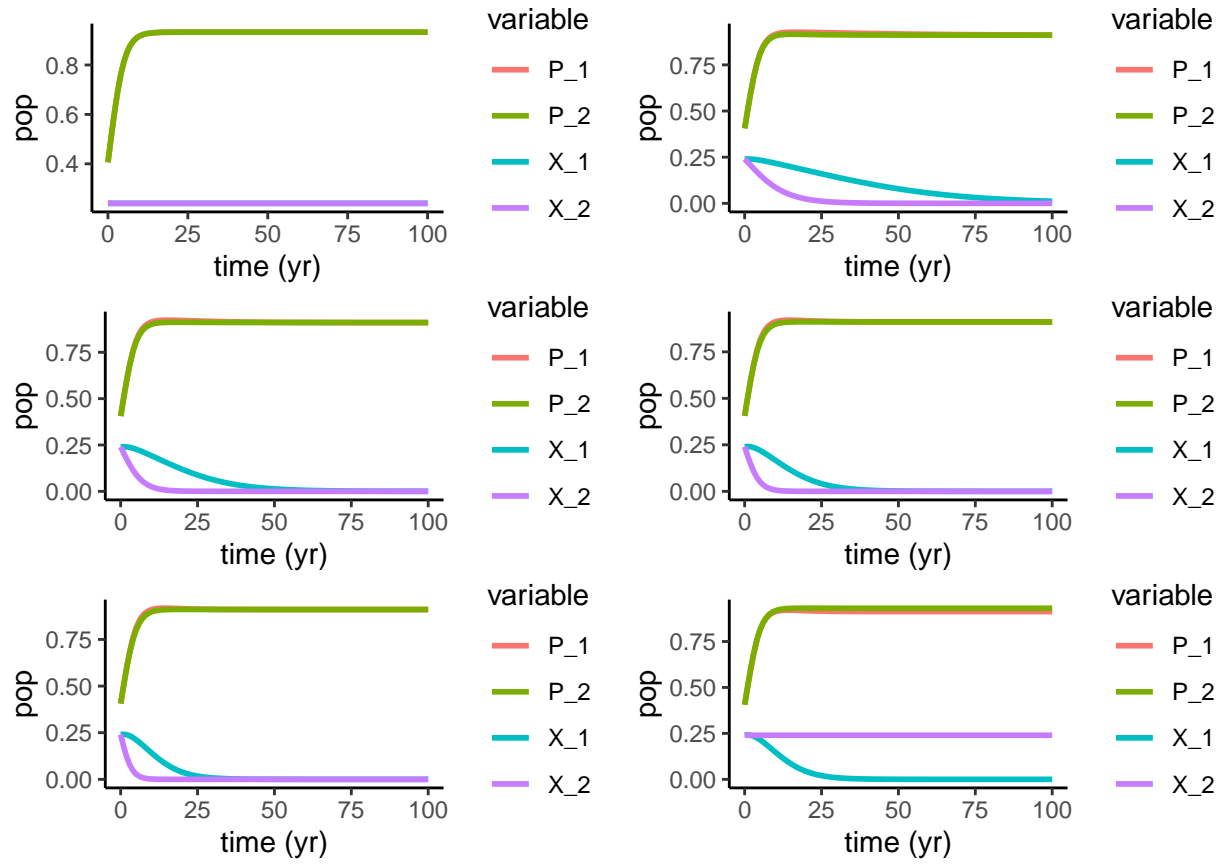


Figure 6: K - Social learning rate 0 to 1

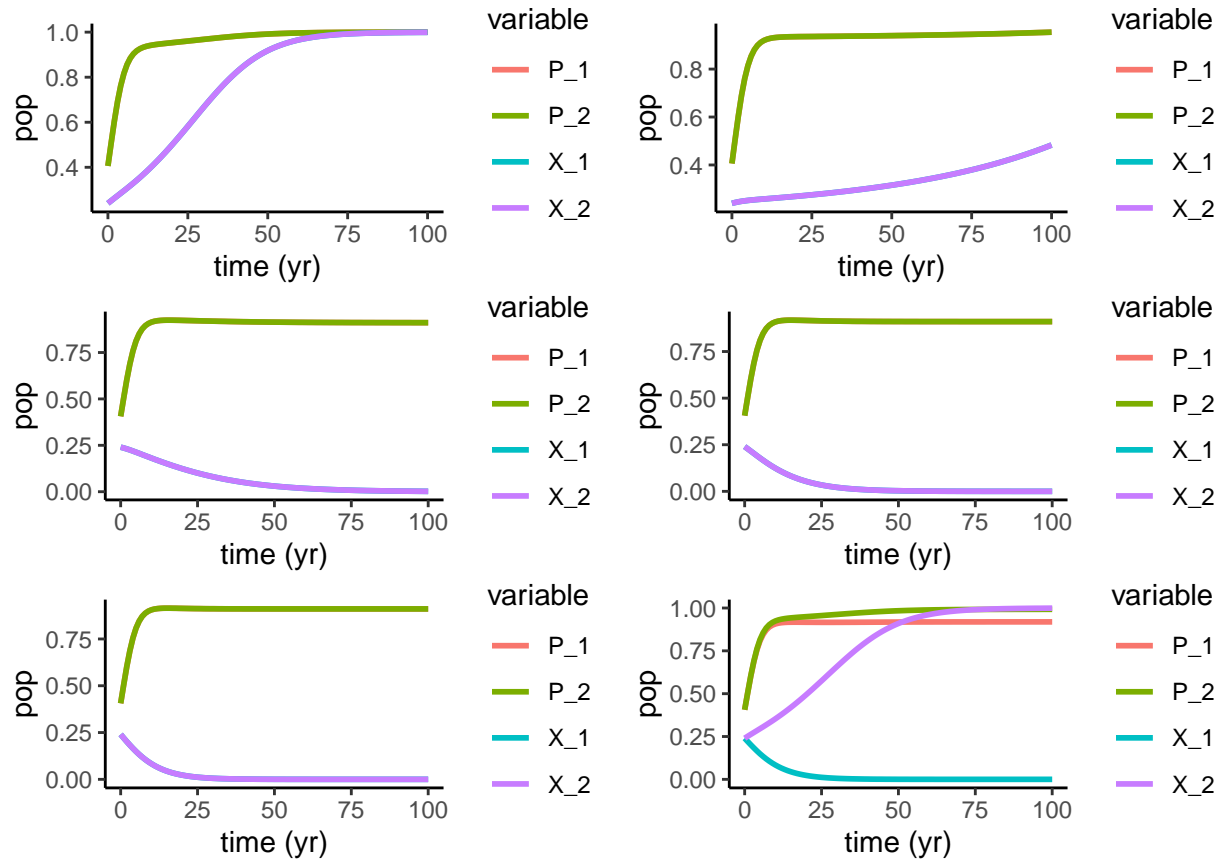


Figure 7: w - conservation costs

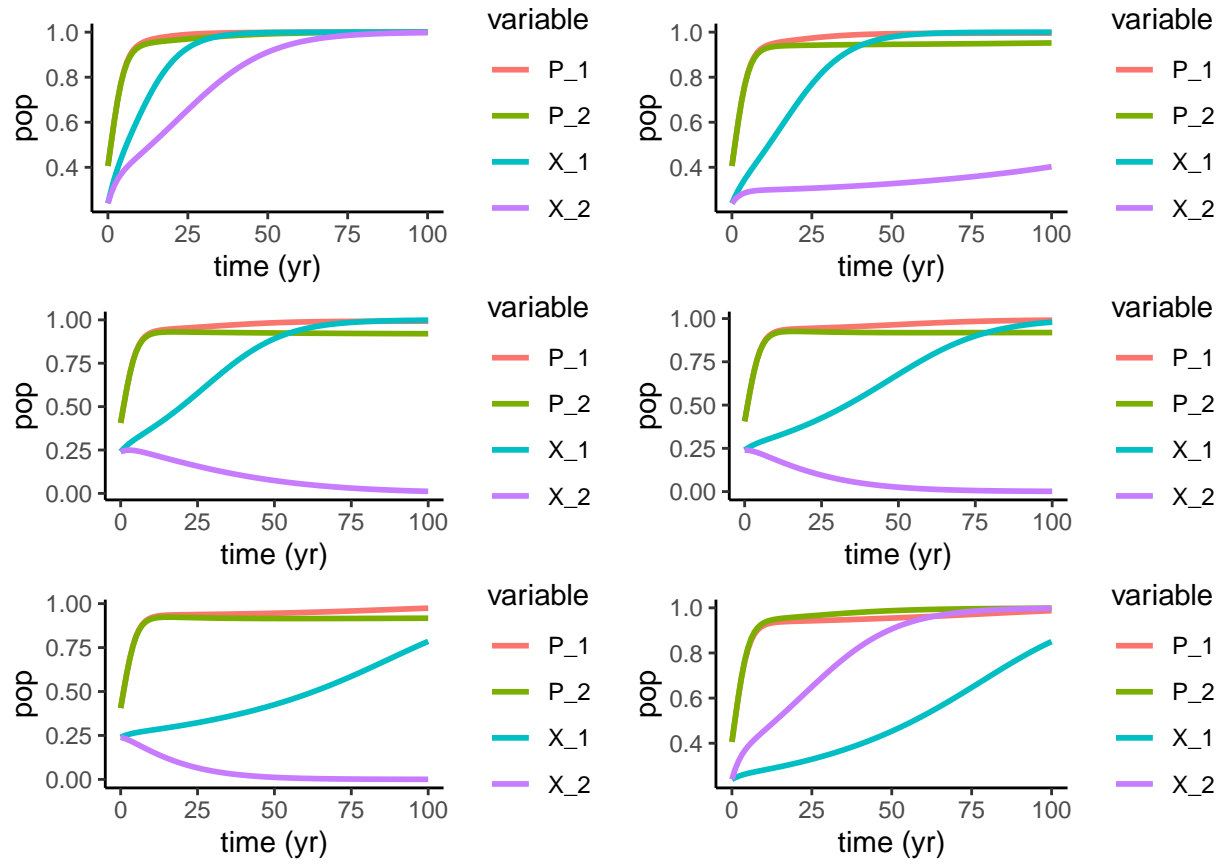


Figure 8: c - rarity valuation param

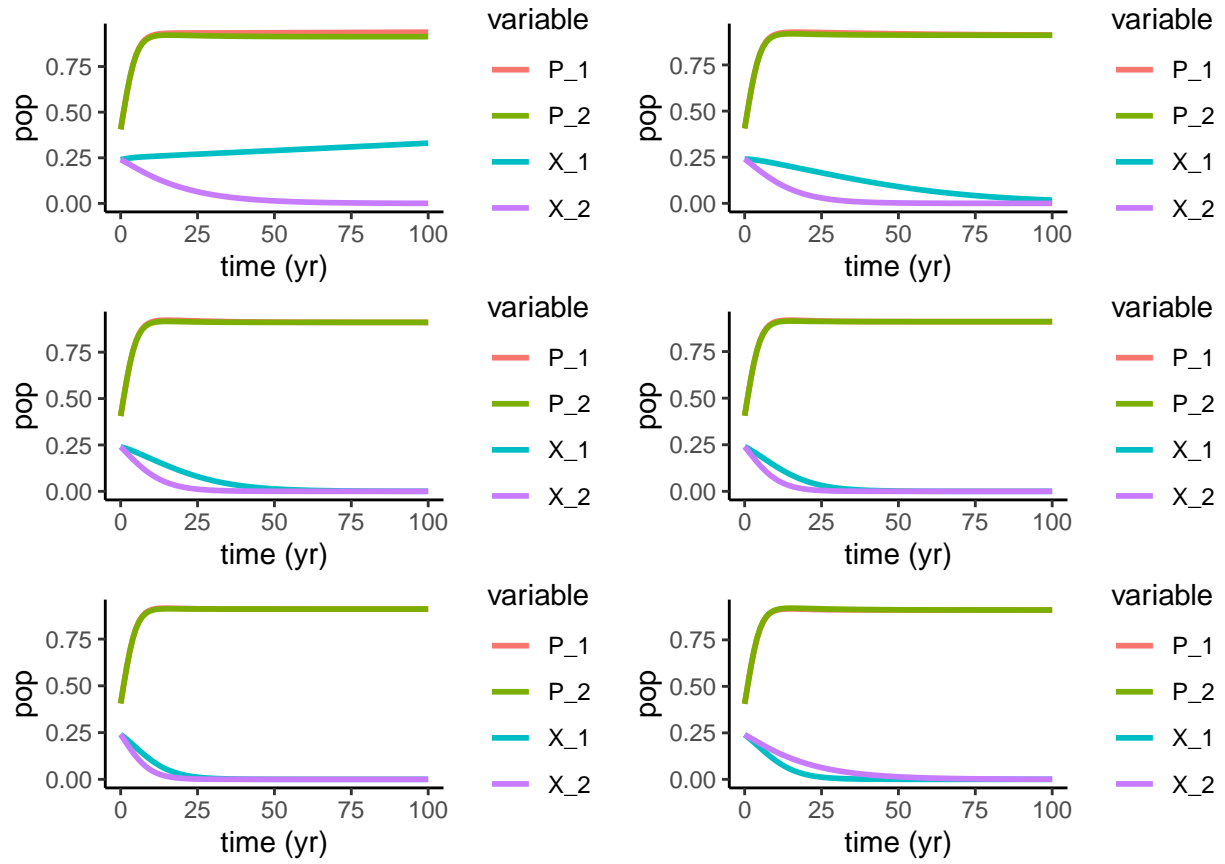


Figure 9: d - social norm strength

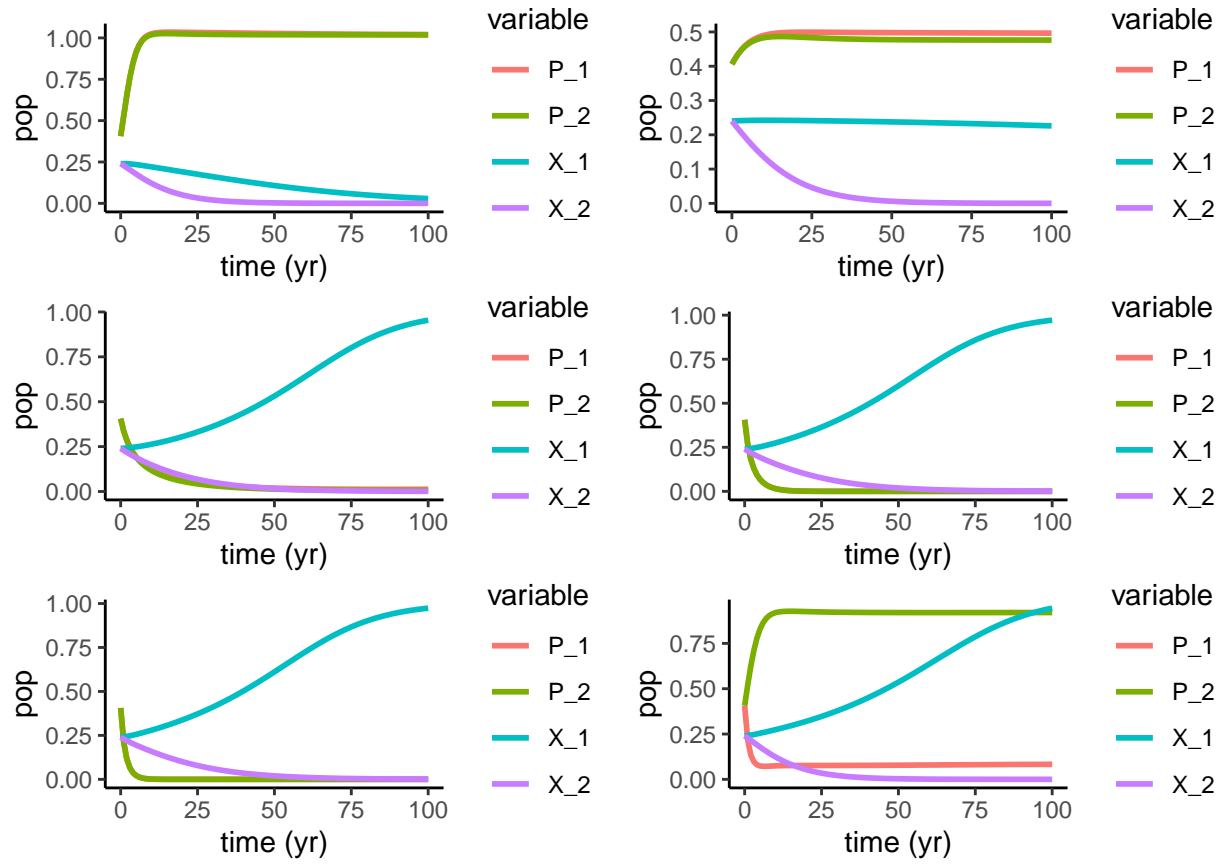


Figure 10: e - fish emigration

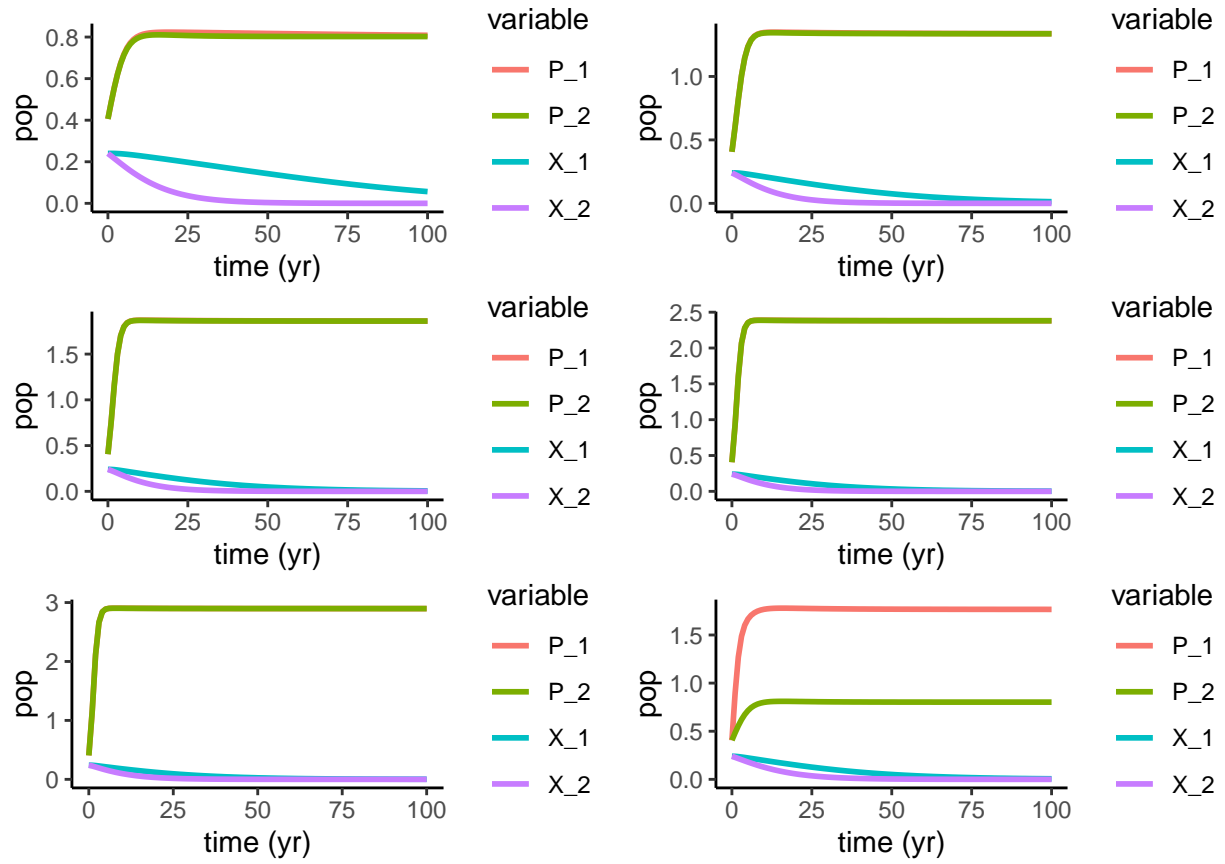


Figure 11: i - fish immigration

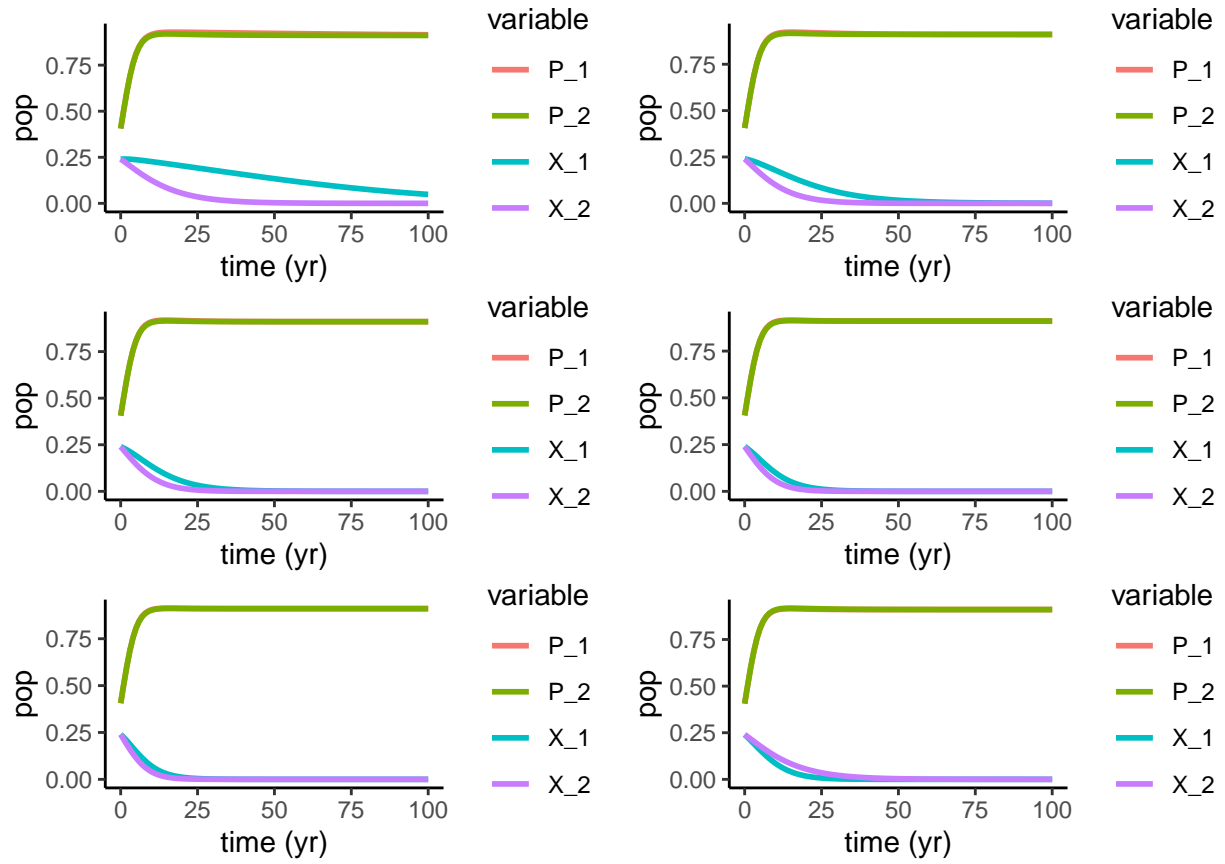


Figure 12: prop - Population influence on the other

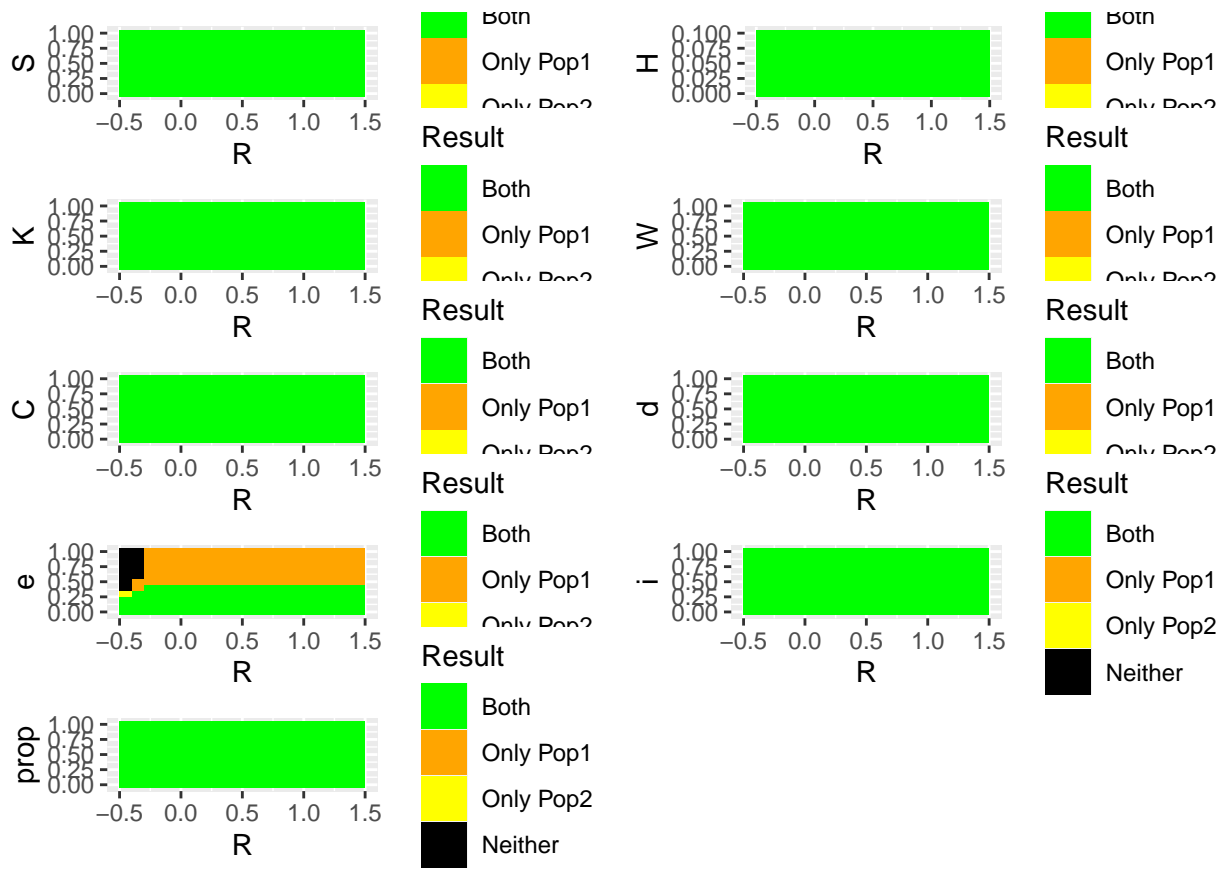


Figure 13: R parameter planes

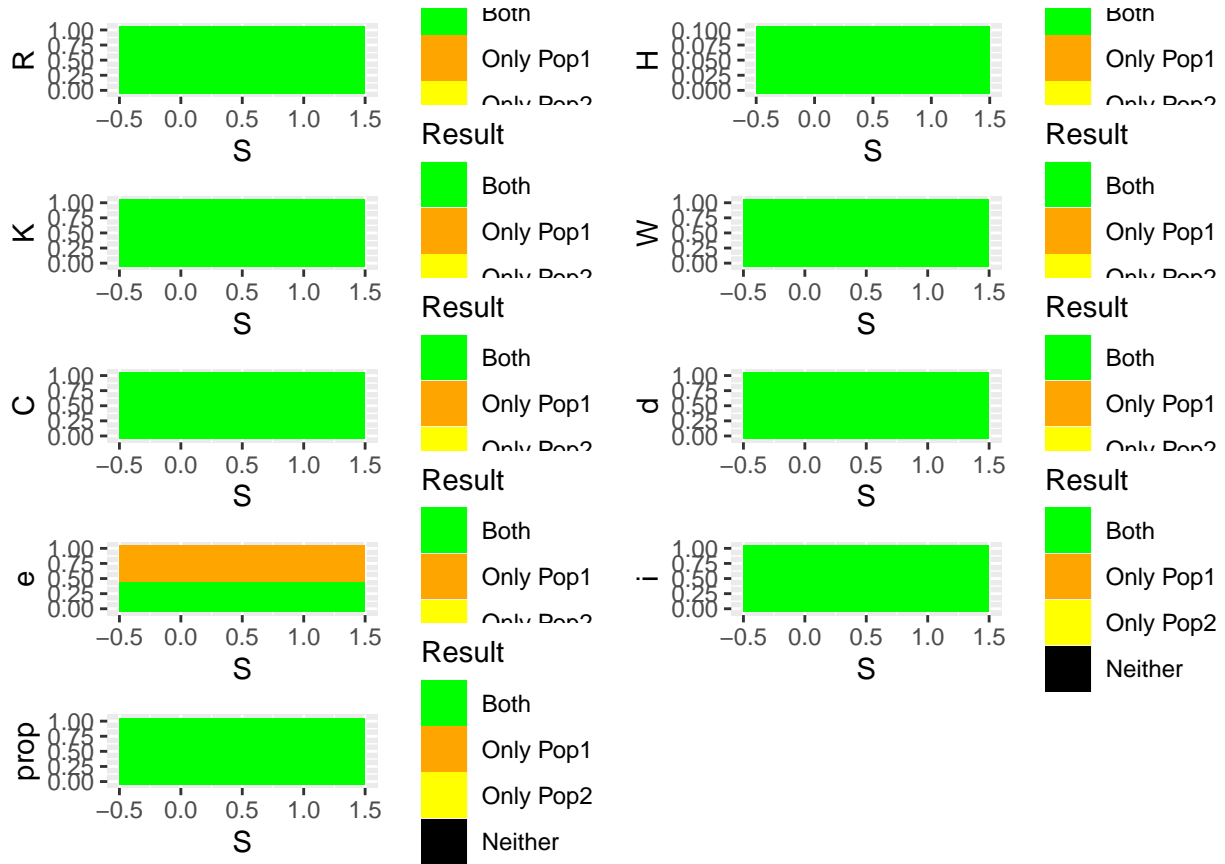


Figure 14: S parameter planes

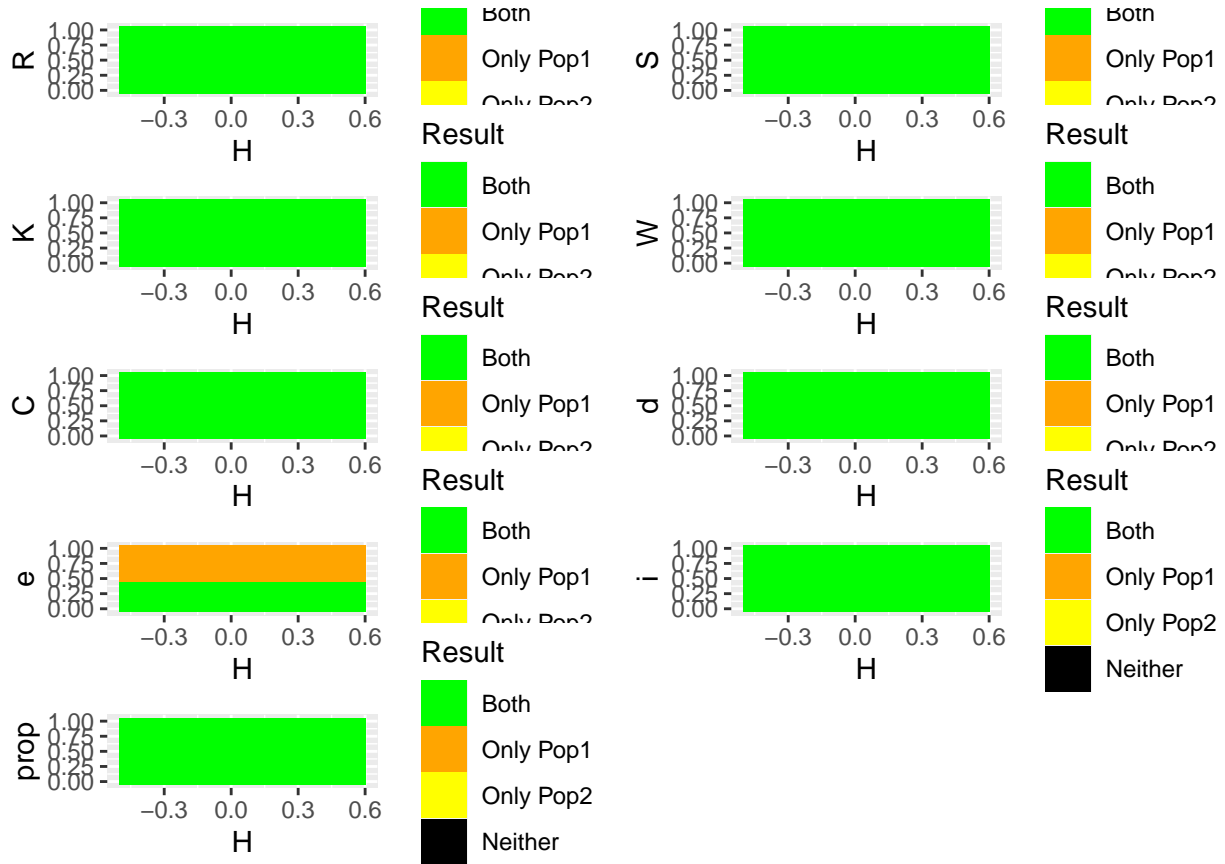


Figure 15: h parameter planes

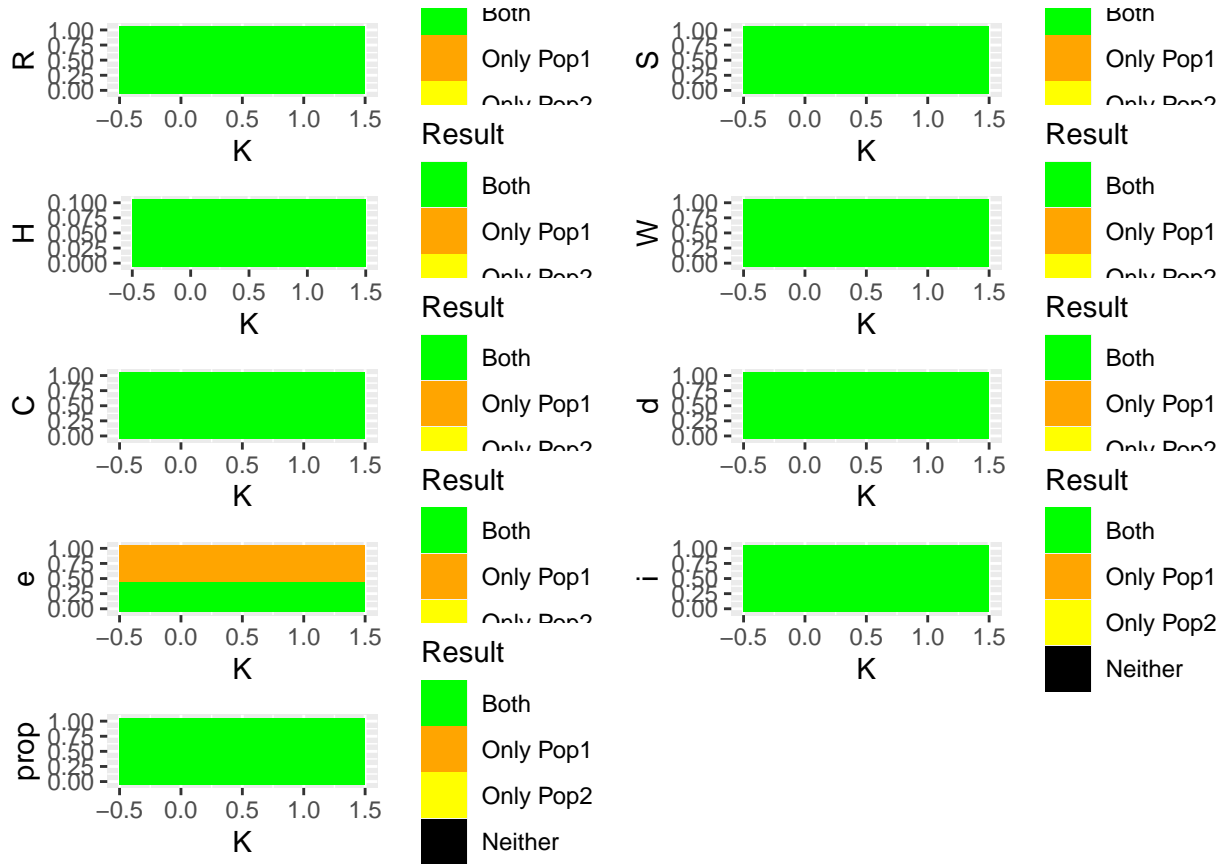


Figure 16: K parameter planes ranging from 0-1



Figure 17: w parameter planes

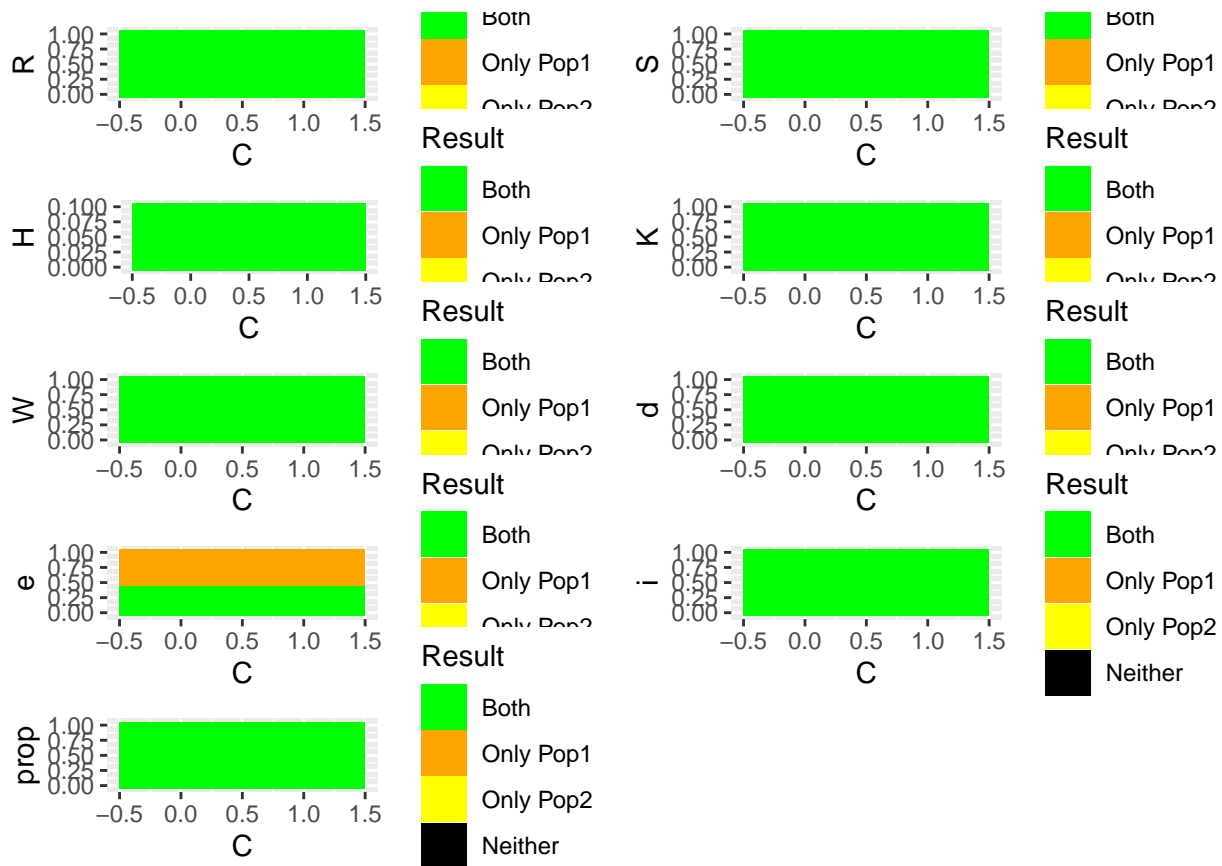


Figure 18: c parameter planes

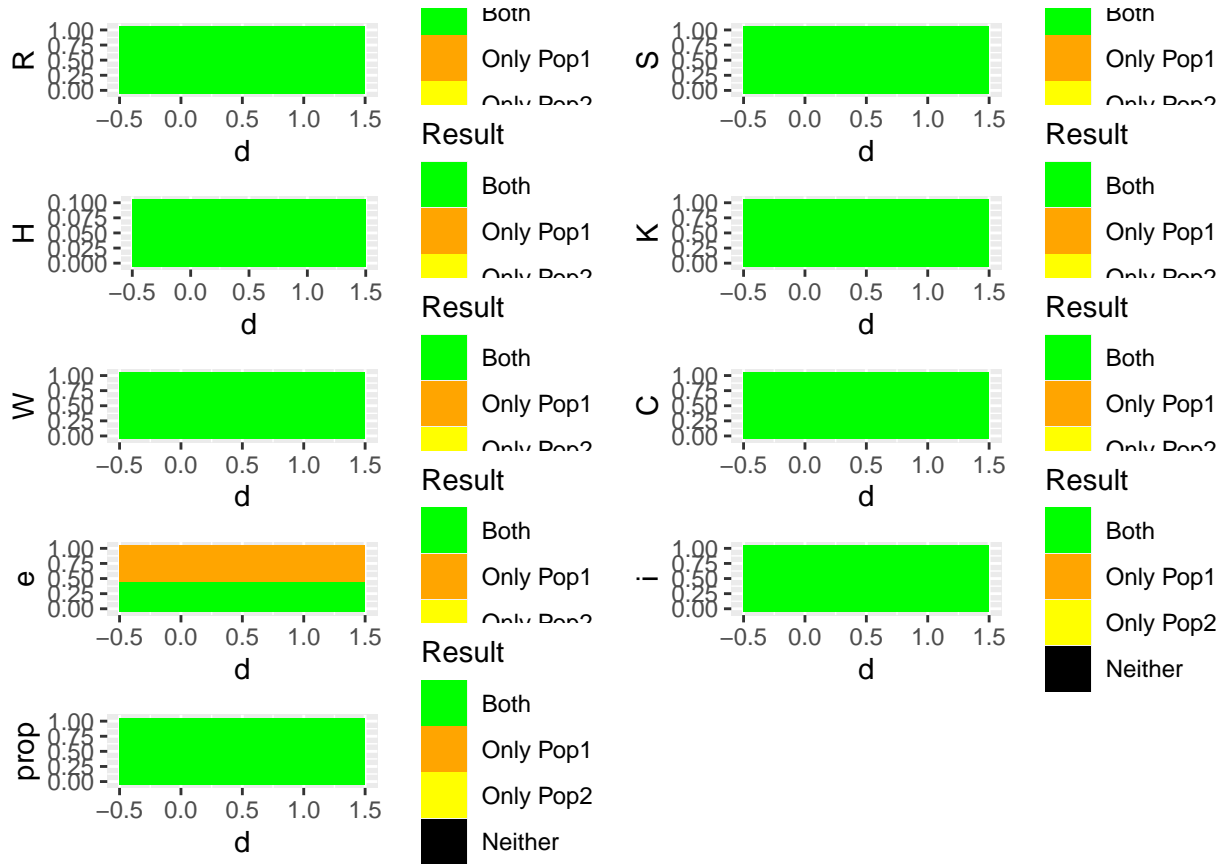


Figure 19: d parameter planes

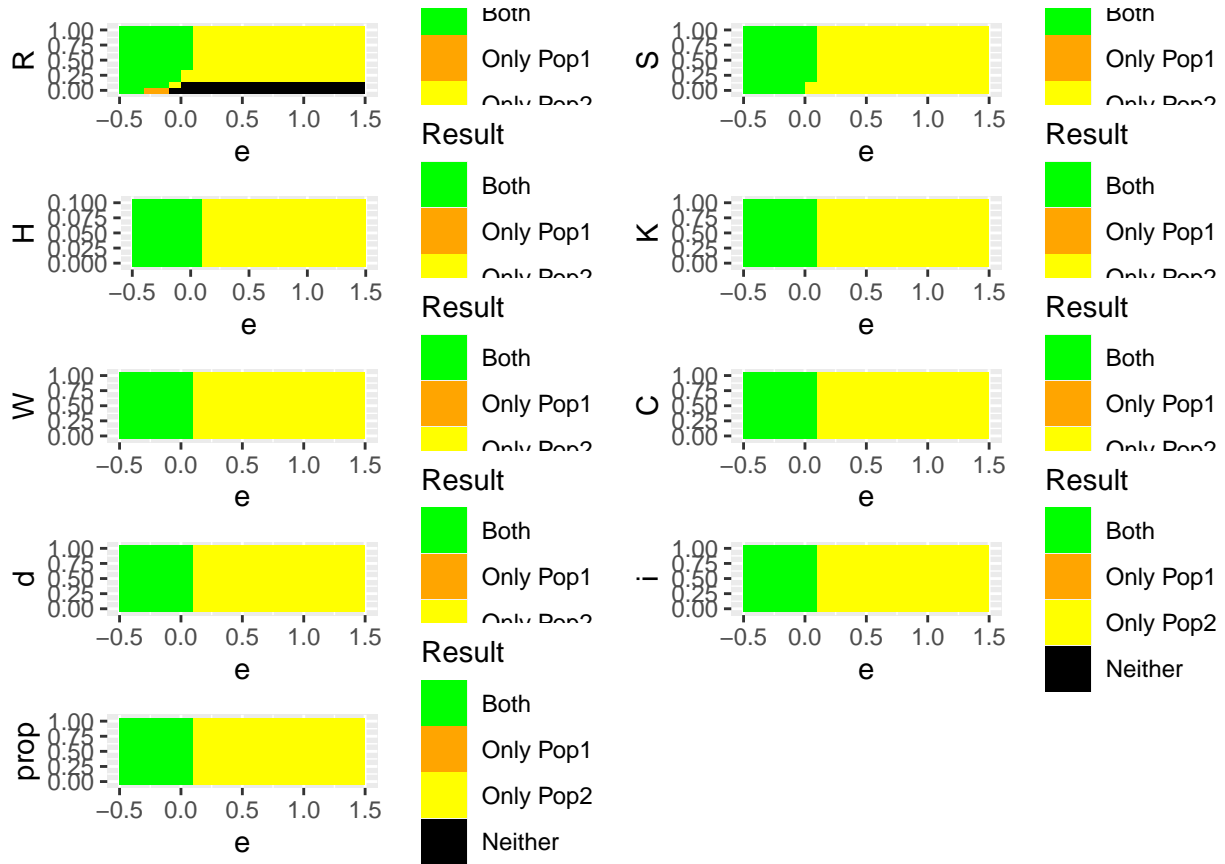


Figure 20: e parameter planes

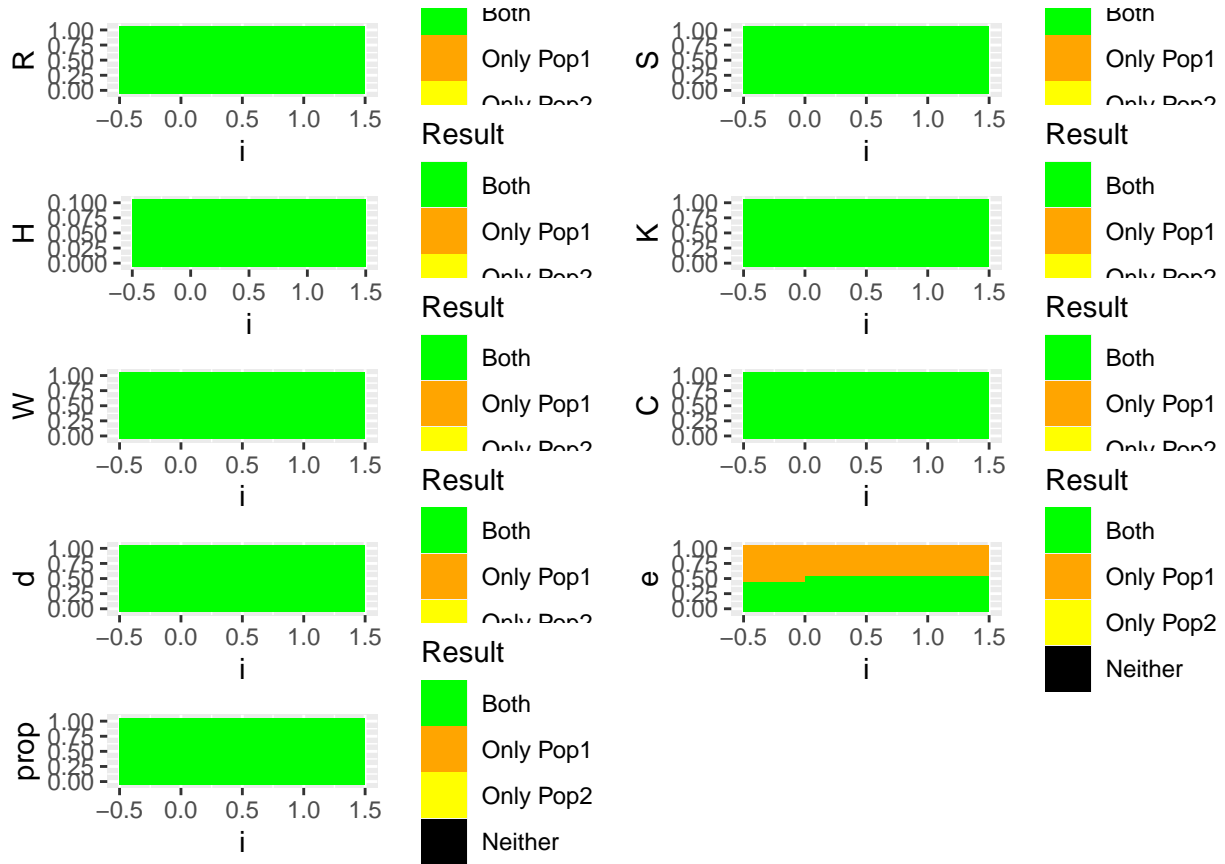


Figure 21: i parameter planes

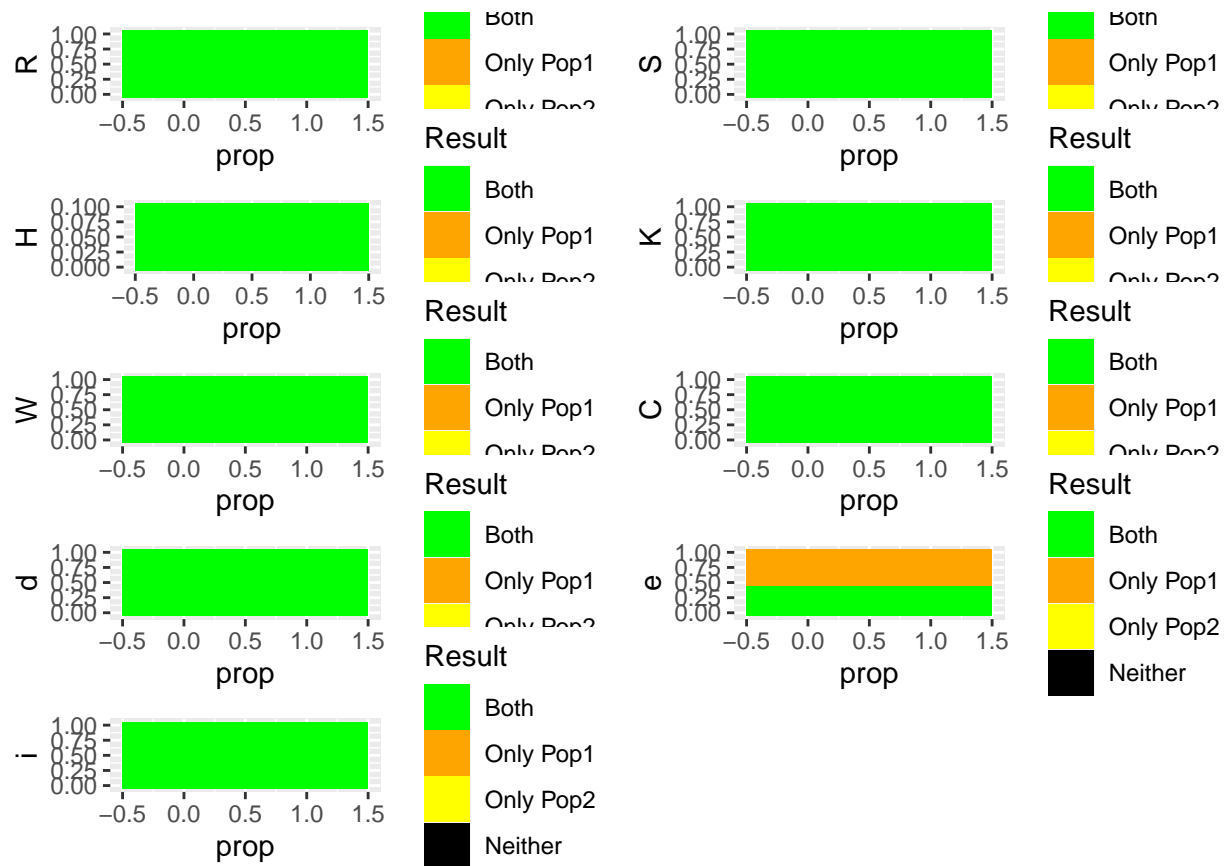


Figure 22: prop parameter planes

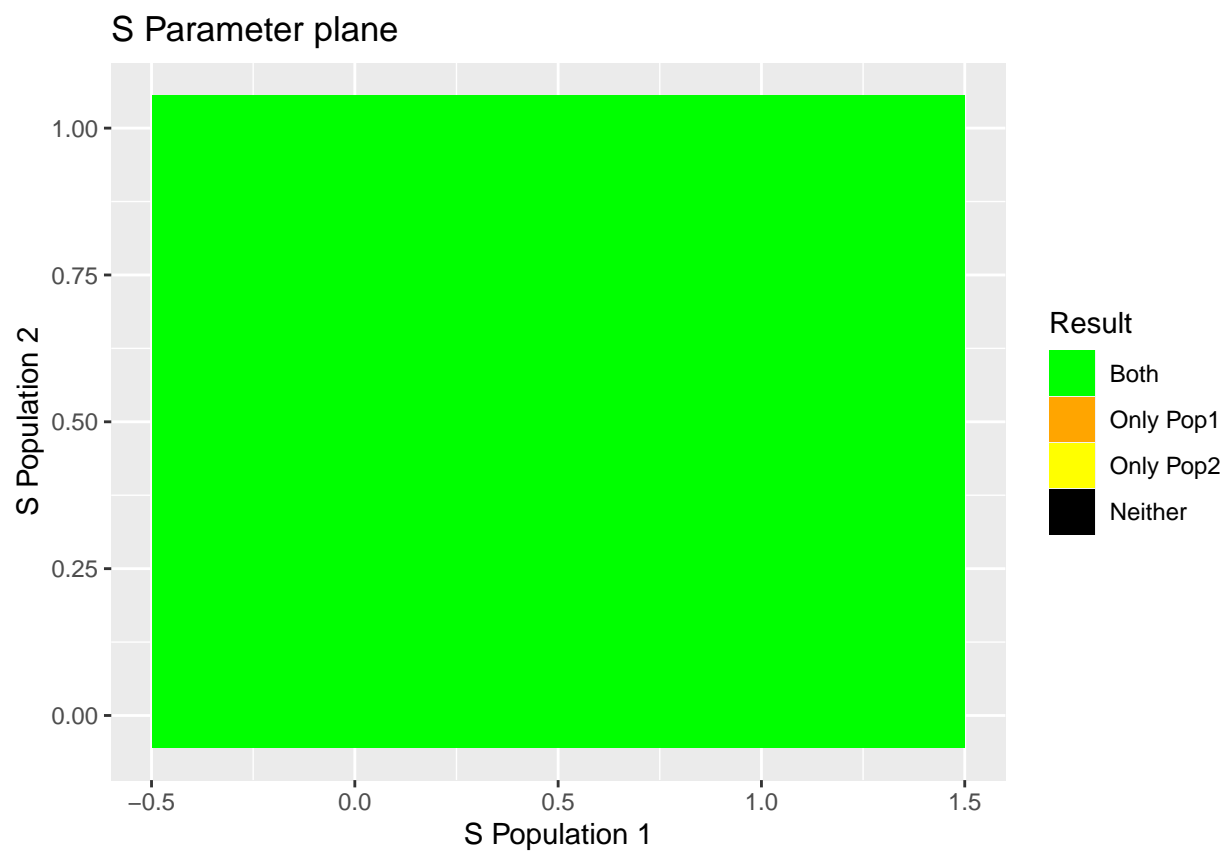


Figure 24: s population planes



Figure 25: h population planes

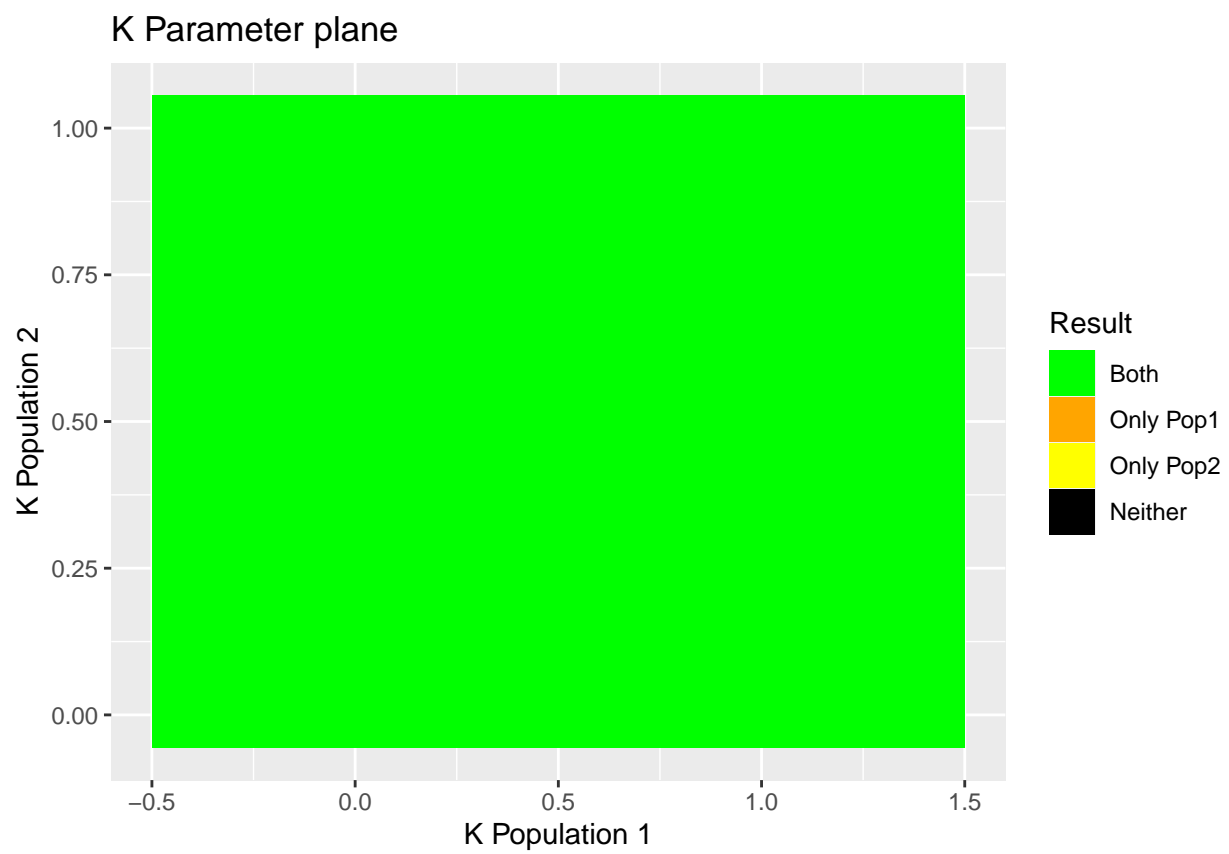


Figure 26: k population planes 0 to 1

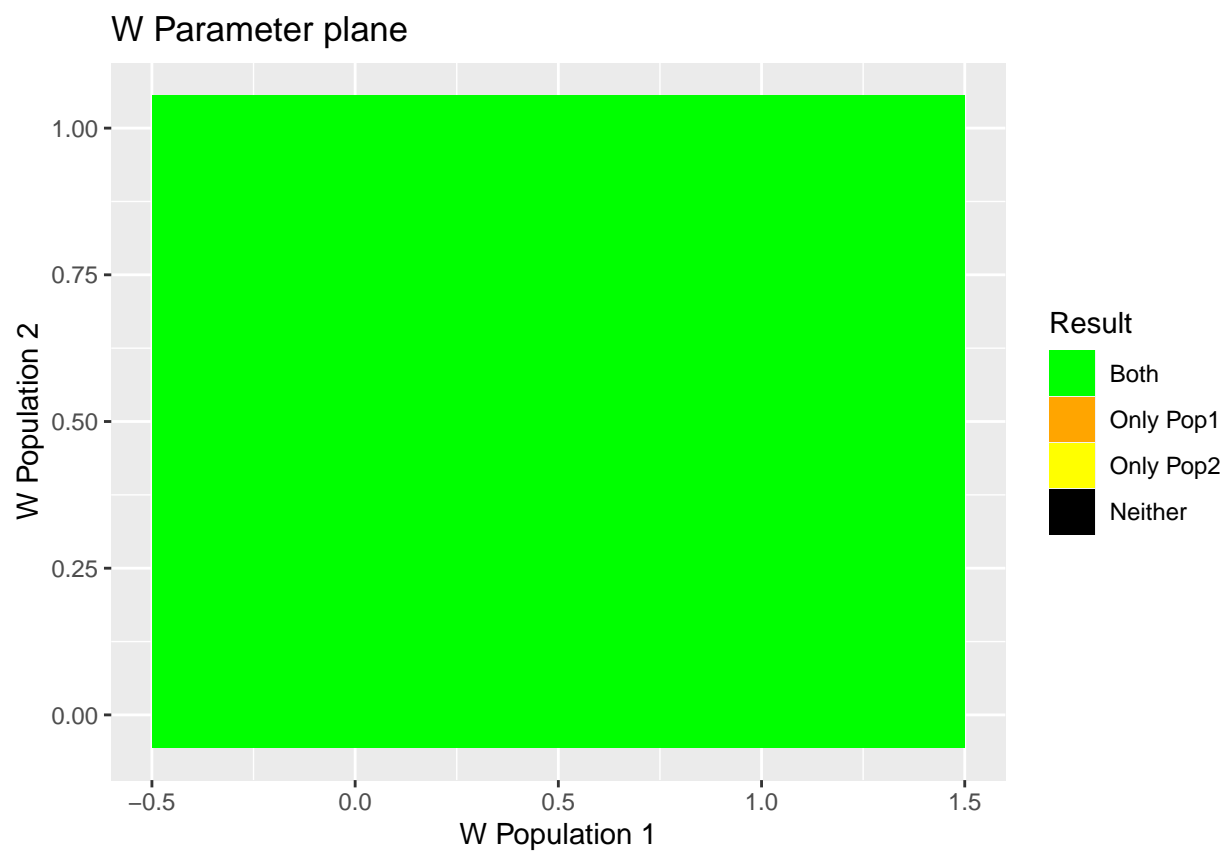


Figure 27: w population planes

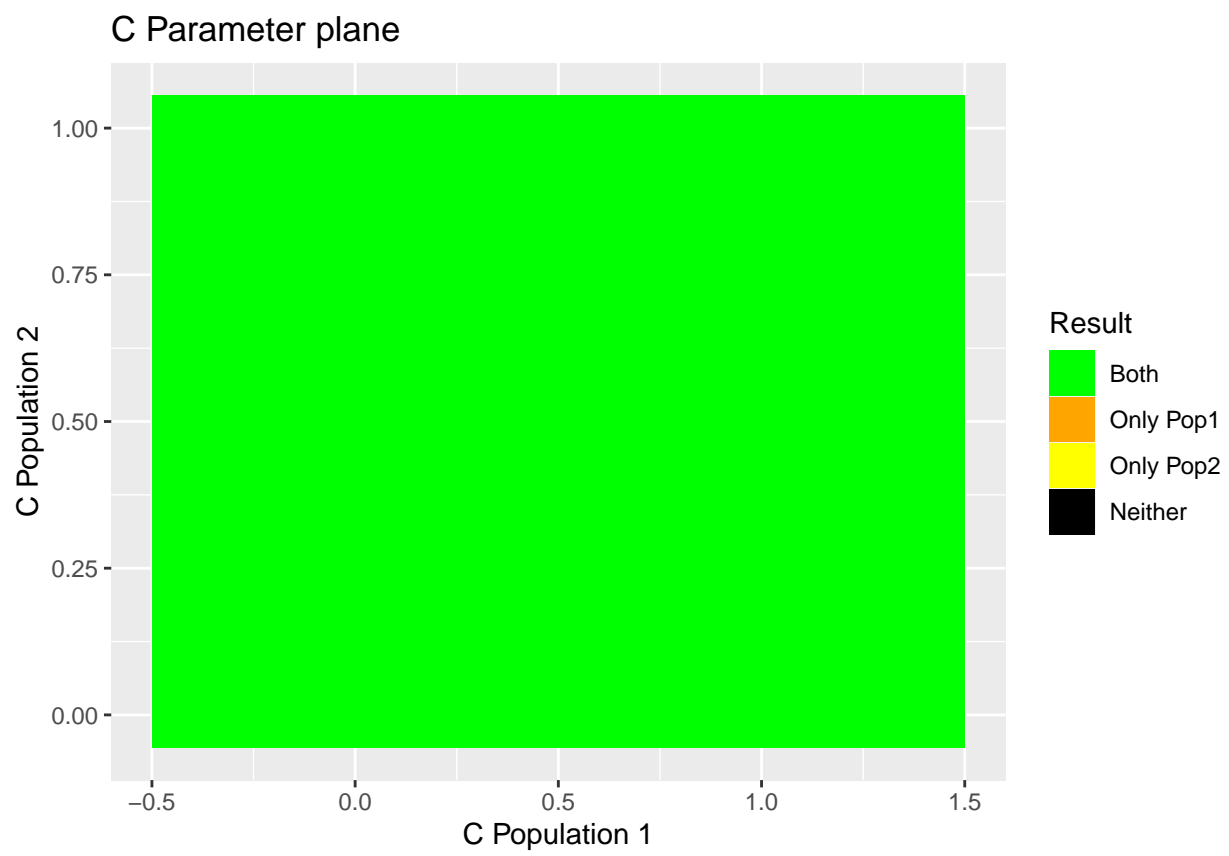


Figure 28: c population planes

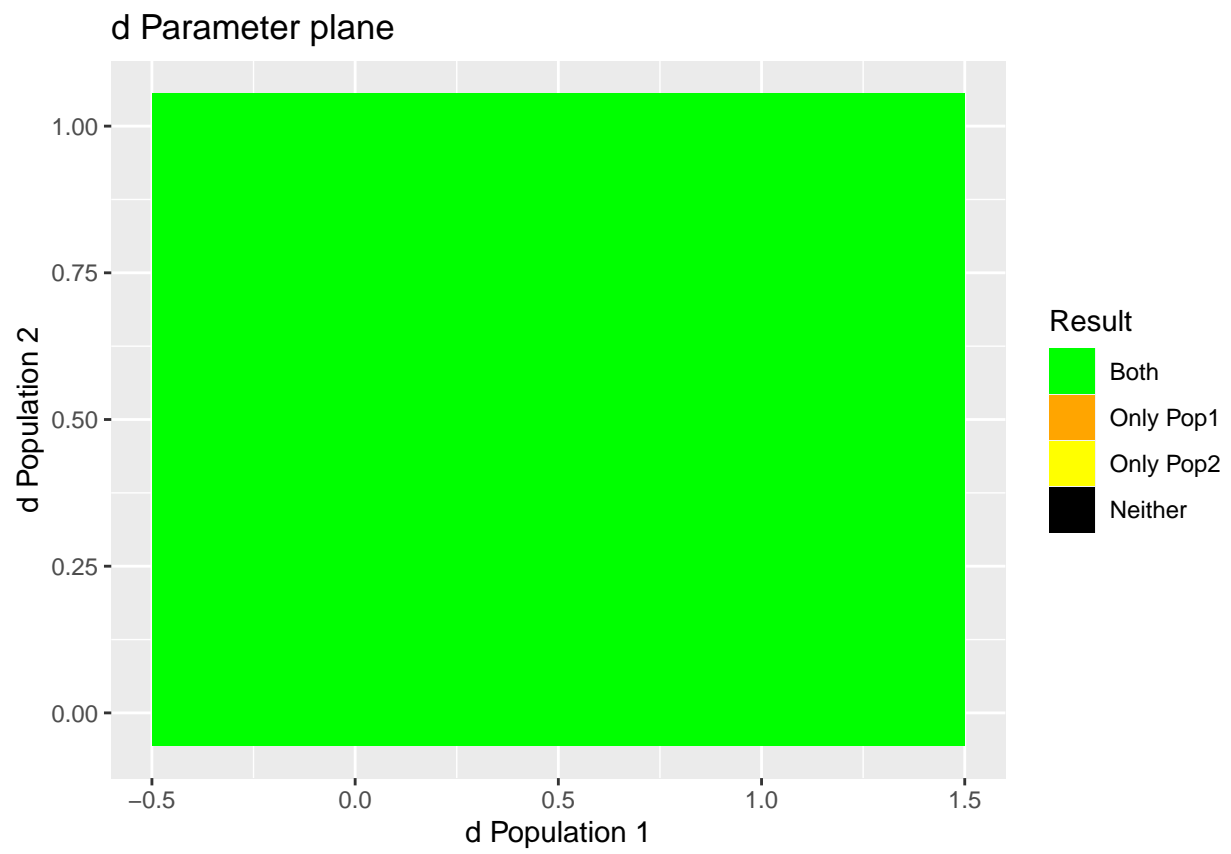


Figure 29: d population planes

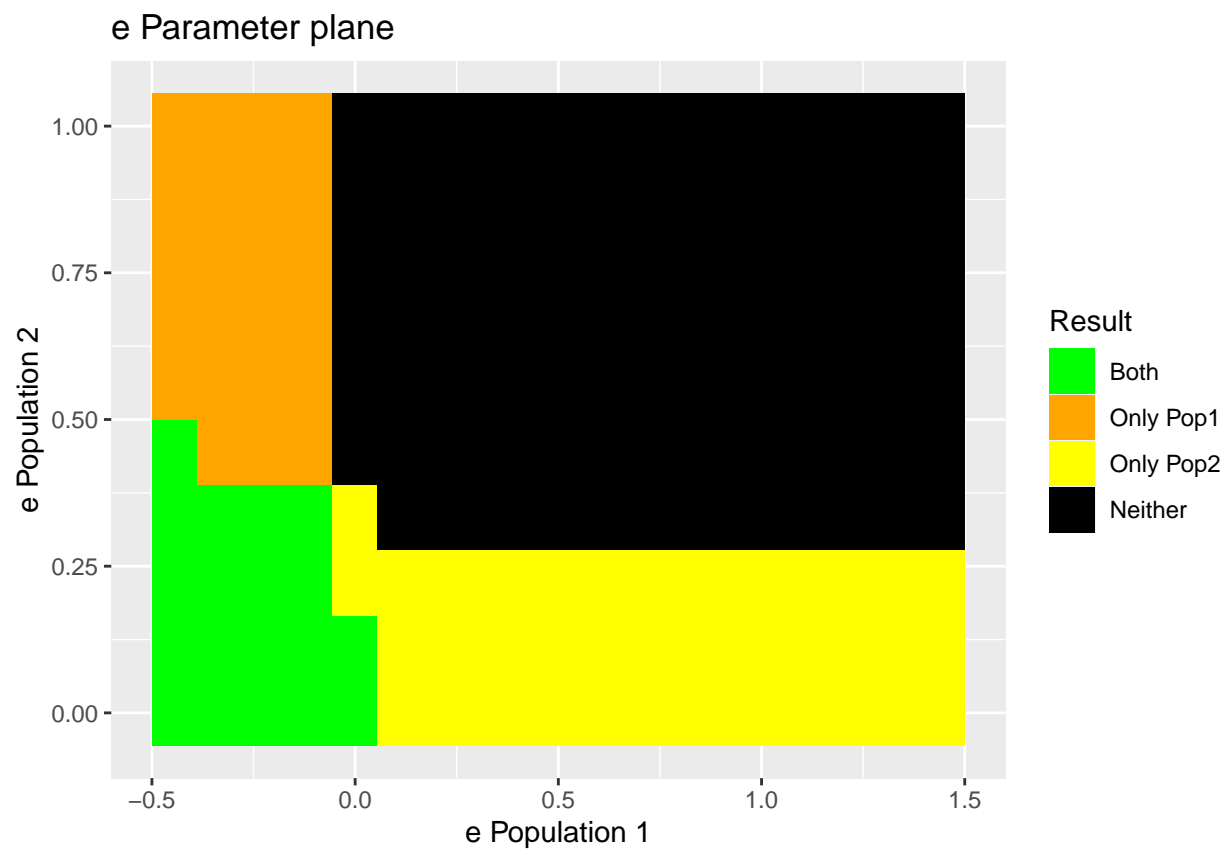


Figure 30: e population planes

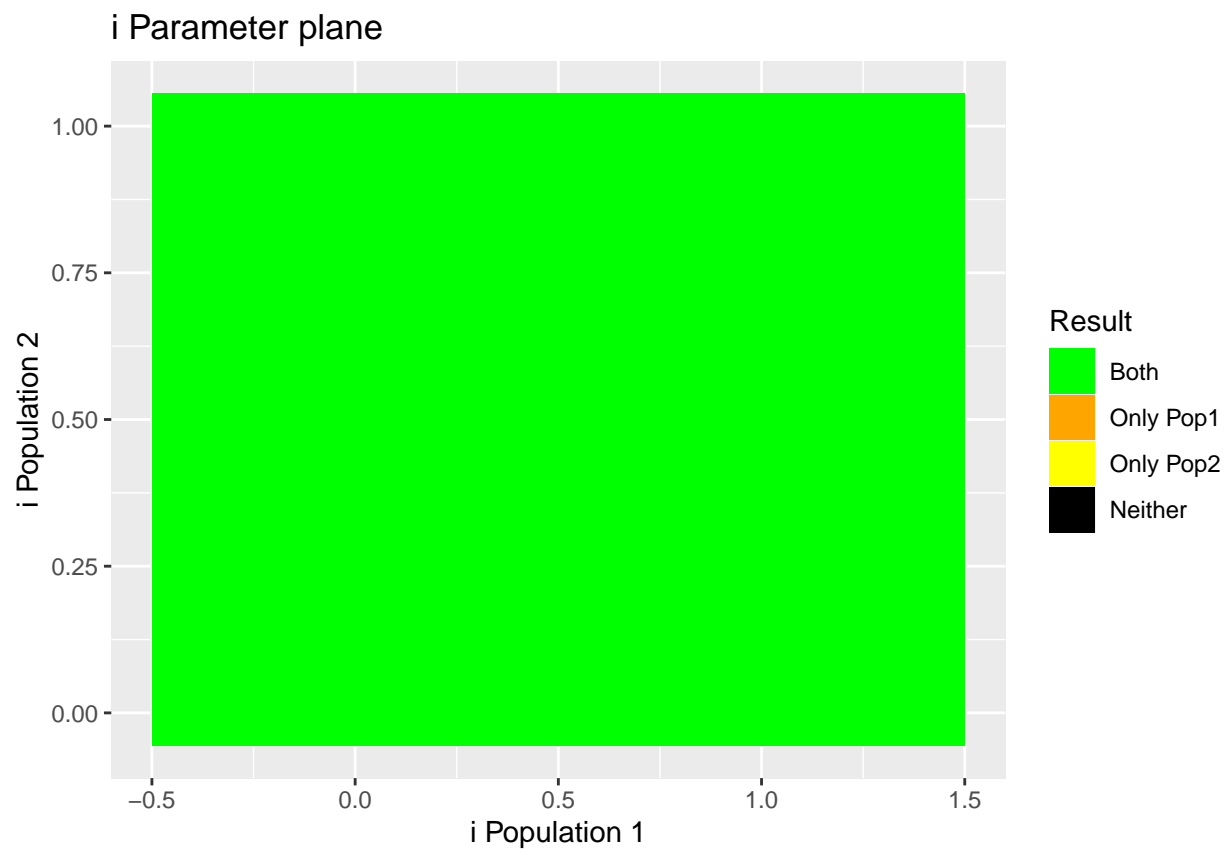


Figure 31: i population planes

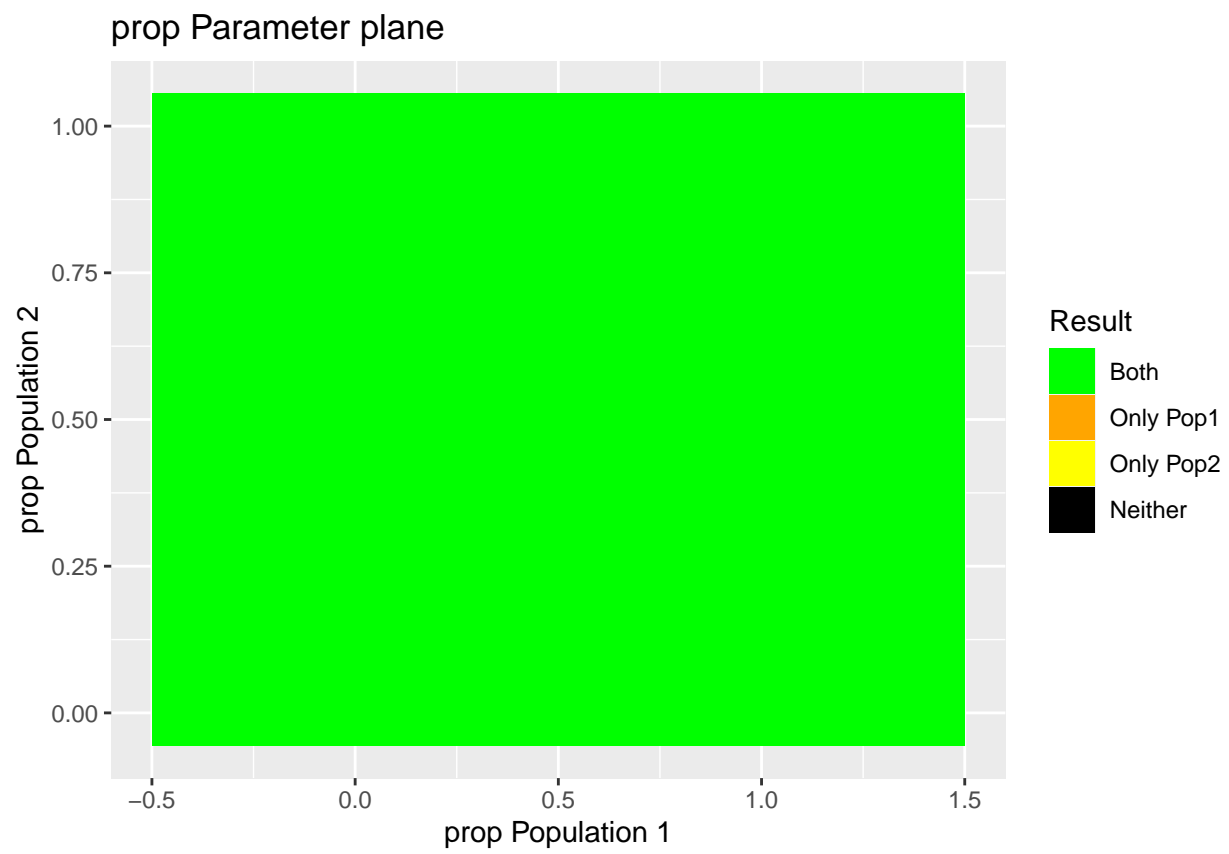


Figure 32: prop population planes