



 $N_{t+1} = gF_{\theta}N_t + s(1-g)N_t$

1. Population model

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$$F_{\theta} = \frac{R_{\theta}}{1 + \sum \alpha_{ij,\theta} N_{j,t}} \longrightarrow N_{t+1} = gF_{\theta}N_t + sO(\frac{1}{2})$$

D coexistence Competitor's 3. Abiotic factor present LDGR =Competitor's $ln\left(\frac{N_{t+1}}{N_t}\right)$ absent Low density growth rate