

## Summary

## Introduction

## Materials and Methods

Basic explanation of the models. We modeled a stage-structured population in two stages: immatures and matures. The demography is given by a transition matrix, with...

From ENGEN ET AL (REF NEEDED), we derived equations for mean variation of phenotype on our model.

We have for variations of phenotype, under weak selection:

$$\Delta \bar{z} = (\theta_f - \bar{z}) \left[ \frac{v_I u_I G_I s_0 m \bar{f}_1}{\lambda(P_I + \omega_f)} + \frac{v_I u_M G_M s_0 \bar{f}_2}{\lambda(P_M + \omega_f)} \right] + (\theta_s - \bar{z}) \left[ \frac{v_I u_I G_I \bar{s}_I (1 - m)}{\lambda(P_I + \omega_s)} \right] \quad (1)$$

Within the square brackets, we see weighting average of fecundity and survival. Thus, we define them as  $\gamma_f$  and  $\gamma_s$  such as:

$$\gamma_f = \frac{v_I u_I G_I s_0 m \bar{f}_1}{\lambda(P_I + \omega_f)} + \frac{v_I u_M G_M s_0 \bar{f}_2}{\lambda(P_M + \omega_f)} \quad (2a)$$

and

$$\gamma_s = \frac{v_I u_I G_I \bar{s}_I (1 - m)}{\lambda(P_I + \omega_s)} \quad (2b)$$

**Results**

**Subheading1**

**Subheading2**

**Discussion**

**Authors Contributions and Acknowledgments**

**References**