Appendix C: Stability analysis when quality types vary in other parameters.

Demographic heterogeneity resulting from different larval histories might influence several characteristics of settlers. These are represented in our model by differences between high and low quality types in parameters α_q, b_{ij}, and δ_q (in addition to θ_q described in the *Results* section of the main text). We consider scenarios in which low quality settlers experience stronger adult-induced mortality ($\alpha_l > \alpha_h$), greater competitive effects on development rate ($b_{li} > b_{hi}$), and higher density independent mortality rate ($\delta_l > \delta_h$). For each parameter, we find the stability boundaries while holding all other parameters equal across quality types (including $\theta_l = \theta_h = 1$).

In Fig. C1, we show the stability boundary when the adult-induced mortality rate for low quality settlers is twice as large as for high quality settlers. The shape of the stability boundary is qualitatively similar to the case in which types differ in development rate (Fig. 2a). However, the range of values of p_h for which the equilibrium is stable for any settlement rate is narrower, and decreasing p_h from 1 increases the range of settlement rates that result in cycles.

Doubling the effect of juvenile competition on development rate has a weaker effect on stability (Fig. C2). Nevertheless, demographic heterogeneity still narrows the range of values of settlement rate for which the equilibrium is unstable (around $p_h \approx 0.1$).

Increasing the density independent mortality rate for low quality juveniles has almost no effect on the stability boundaries. In Fig. C3 we show the results when δ_l is increased by a factor of 10. The equilibrium is unstable for intermediate values of settlement rate regardless of the mixture of high and low quality settlers.

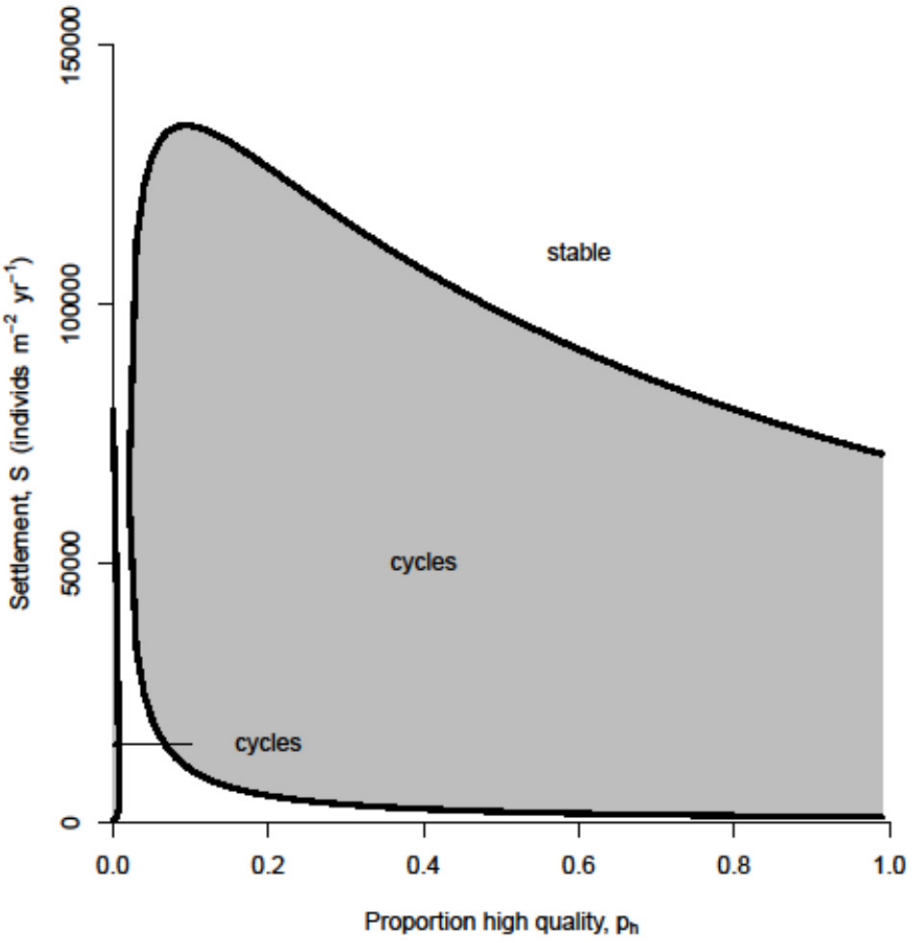

FIG. C1. Stability boundaries when low quality settlers are more vulnerable to adult-induced mortality (α_h=10, α_l=20). The model predicts an unstable point equilibrium with stable limit cycles for the range of S indicated by shading.

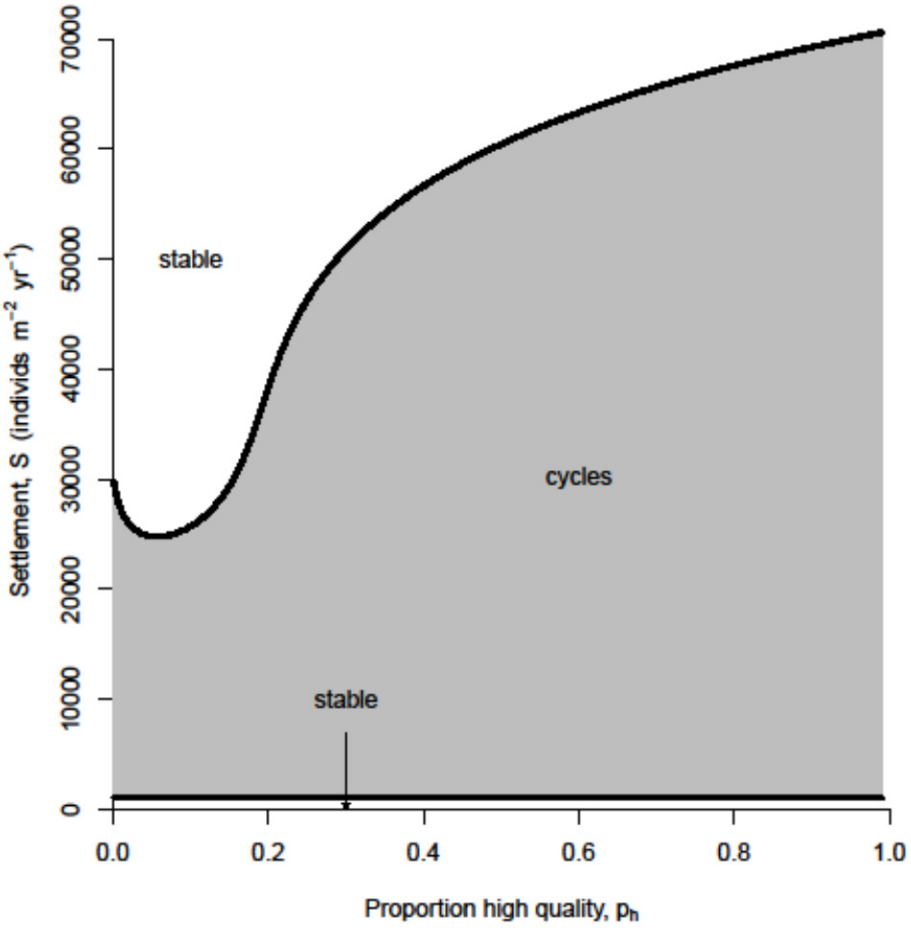

FIG. C2. Stability boundaries when low quality settlers experience greater competitive effects on development rate (b_{ll}=b_{lh}=0.0002, b_{hl}=b_{hh}=0.0001). The model predicts an unstable point equilibrium with stable limit cycles for the range of S indicated by shading.

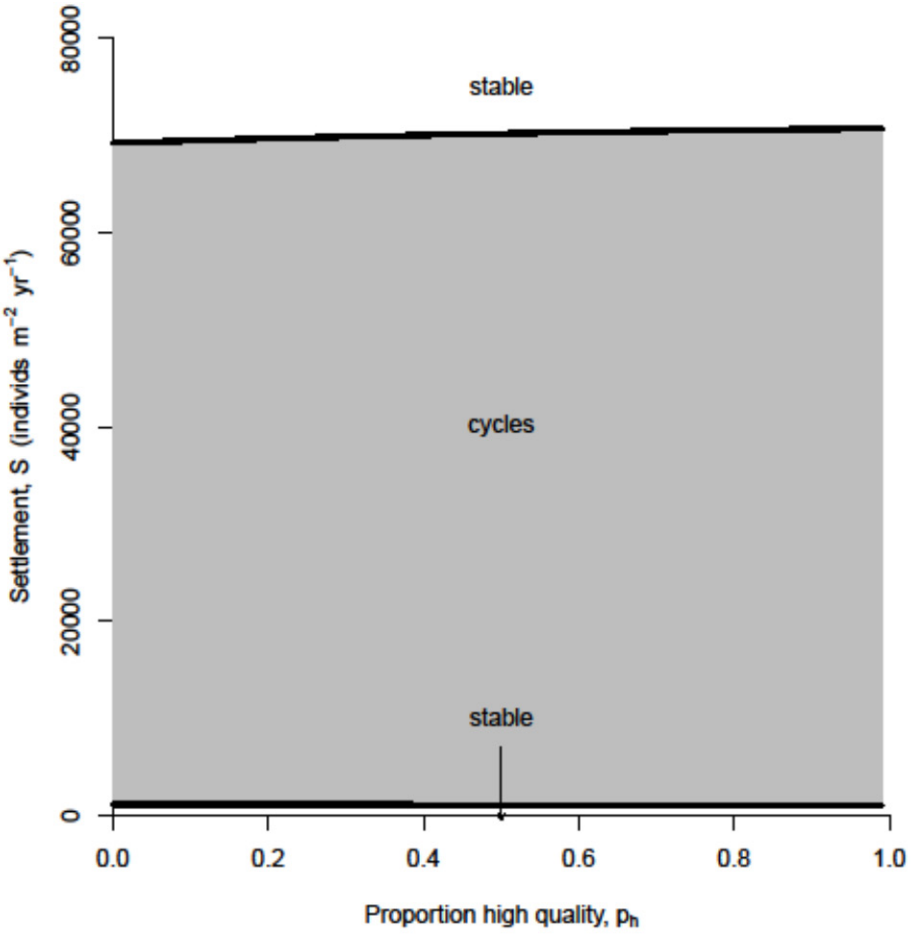

FIG. C3. Stability boundaries when density independent mortality is higher for low quality settlers than for high quality settlers (δ_l=0.1, δ_h=0.01). The model predicts an unstable point equilibrium with stable limit cycles for the range of S indicated by shading.