Ecological Archives **E090-010-A2**

Jessica J. Kuang and Peter Chesson. 2009. Coexistence of annual plants: Generalist seed predation weakens the storage effect. *Ecology* 90:170–182.

Appendix B. A more general form of the model

As discussed in Kuang and Chesson (2008), a more general form of the model in the text is given by the equations

$$\begin{cases} N_j(t+1) = N_j(t)\left(s_j(1-G_j(t)) + G_j Y_j e^{-C(t)-a_j P(t)}\right) \\ P(t+1) = \sum_{j=1}^{n} b_j G_j(t) Y_j N_j e^{-C(t)}\left(1-e^{-a_j P(t)}\right) + s_p P(t) \end{cases} ; \quad j = 1,\ldots,n \tag{B.1}$$

where

$$C(t) = \sum_{j=1}^{n} d_j G_j(t) N_j(t).$$

In these more general equations, two new parameters are introduced: d_j , a competition coefficient, and b_j, the conversion rate between prey consumption and predator birth. These two parameters give each prey species a unique competitive effect and a unique nutritional value to the predator. However, these more general equations do not give different dynamics because they reduce to expressions (1-4) of the text by nondimensionlization. For this nondimensionalize, the separate parameters b_j and d_j are replaced by their ratios b_j/d_j. Assuming that these ratios are the same for each species under the reasonable assumption that nutritional value and competitive effect are proportional to each other (Kuang and Chesson 2008), we can replace N by dN, P by $(d/b)P$, and a by $(b/d)a$. Equations (B.1) then become (1-4). It is worthwhile noting that in these nondimensionalized equations, seed density is measured in units of competitive effect per unit area because d is the competitive effect of a seedling, which may be proportional biomass.

Literature Cited

Kuang, J. J., and P. Chesson. 2008. Predation-Competition Interaction for seasonally recruiting species. American Naturalist **171**:E119–E133.