

In the following, I've used a standard Lotka-Volterra competition model to illustrate the main points rather than the full guild model. If we have a Lotka-Volterra system with the parameters defined in the usual way:

$$\frac{dB_i}{dt} = r_i \left( 1 - \frac{B_i + \sum_j \alpha_{ij} B_j}{K_i} \right) B_i - F_i N_i$$

The analyst who is unaware of the interactions (or ignores them) and fits a simple Schaefer model to the data is therefore working with:

$$\frac{dB_i}{dt} = r_i \left( 1 - \frac{\sum_j \alpha_{ij} B_j}{K_i} \right) B - \frac{r_i B_i^2}{K_i} - F_i N_i$$

and thinks that they are estimating  $r$  when in fact they are estimating:

$$r' = r_i \left( 1 - \frac{\sum_j \alpha_{ij} \bar{B}_j}{K_i} \right)$$

the rest is as in a standard Schaefer model and its only the estimate of  $r$  that's affected (beyond issues that arise with covariance in the estimates of  $r$  and  $K$ ). The model can't accommodate dynamic changes in  $B_j$  so the model is implicitly fitting a mean abundance level (constant) for the interacting species. If the  $\alpha_{ij}$  are all equal to zero, this all of course does revert directly to Schaefer.

I think the significant thing about this relative to the concern that has been raised is that while it's true that the analyst who thinks he/she is estimating 'true'  $r$  (with no interactions) is of course not doing so, unless the  $B_j$  are simultaneously at high abundance, they are also not estimating the  $r_i$  under a Bmsy policy which ignores interactions. In the forty odd years that we've been doing our surveys, we haven't had all the GARM species simultaneously at high abundance and I think this is telling us something important about the nature of the interactions and their importance. So to my mind, the concern that has been raised would have full force if in fact we had a situation where the all species had in fact been simultaneously at high abundance in the course of the time frame available for analysis. As it is, we are probably in some intermediate ground.