Catastrophes Are Still Interesting

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Erb and Boyce are right to agree with Caughley (1994) that catastrophes can be thought of as extreme stochastic events. To do so, however, does not require that we abandon them as worthy of study in their own right. These rare events have the ability to put populations at considerable risk, and even small differences between the tails of an expected curve and actual die-off severities may have profound effects on population viability.

Erb and Boyce's analytical critique of my paper (Young 1994) is restricted to a minor result, and the one that I suggested at the time was most likely to be a sampling artifact. I am gratified that they have been able to manipulate the data to make them look more like the "normal" tail of a distribution. This bypasses the question of why I found, with my methodology, an abundance of 70–80% die-offs, compared to a virtual absence of die-offs >90%. This remains suggestive of buffers against population extinction.
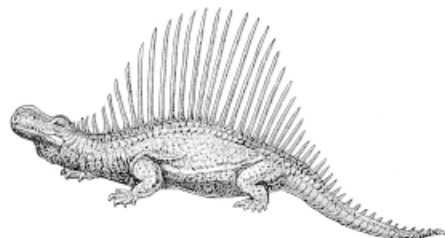
I would like to address briefly their five primary concerns. (1) My inclusion of only die-offs greater than 25% is not responsible for the apparent overabundance of reported die-offs of 70–90%, as a little reflection will confirm. (2) My statement about the apparent commonness of die-offs, like that of Harwood and Hall (1990), fully takes into account events that affect multiple species. (3) and (4) I am gratified that more than 90% of my cases held up to their reevaluation (although I wish that both I and the data available were perfect). (5) I suspect that few conservation biologists would agree with Erb and Boyce's statement that a 90% population "decline over a 6-year period . . . hardly constitutes a catastrophe," especially when applied to large mammals. The new IUCN guidelines reserve their direst category, "critically endangered," for populations with "an observed, estimated or suspected severe decline of at least 80% during the last ten years or three generations" (Mace & Stuart 1994). By their guidelines, most of the populations reported in Young (1994) would be listed as endangered or vulnerable by virtue of their natural fluctuations.

The fact that the distribution of die-off severities may look more like a tail than a bump in no way implies that catastrophic die-offs are "much less common" than I suggested. My suggestion of their relative abundance was not based on the apparent bump at 70–90%, but on the actual number of cases I found. For all their re-analysis, the vast majority of the die-offs are still there and are virtually as common as I originally asserted. The other patterns I found were pretty neat, too. Take a look.

Literature Cited

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