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Evaluating Models of Departure Strategies in Alcids

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How should models in ecology be evaluated? Gaston (1998) charges that the "good fit with empirical observations that otherwise are difficult to explain" of alcid nest-departure models put forth in Ydenberg (1989) and Ydenberg et al. (1995) "may be a mere fluke." Although perhaps an uncharitable view, it is, of course, a possibility, and it reminds us that models should never be too readily accepted, even when they enjoy apparent success. They need to be subjected to repeated and rigorous testing in a variety of circumstances.

In his commentary, Gaston (1998) investigates the quantitative evidence for and against one of the model's key assumptions. I welcome and applaud this scrutiny, and I agree that the quantitative case here is far from closed. I acknowledge that issues of how and when to measure some of the input parameters need to be resolved, and I agree that the model's robustness to input variability should be explored. More data are also needed, although gathering them likely will be a lengthy process given the realities of the field work required. Few researchers have been

as dedicated to this slow and difficult work, or as successful, as has Gaston himself.

I would assert, however, that the most immediate value of these models has been overlooked among the doubts that Gaston raises: these models have helped identify new questions to ask, new and quantitative hypotheses to test, and a new view of life-history evolution in the Alcidae. Any reader who feels this is an audacious claim should peruse accounts of the Alcidae such as *The Thick-billed Murres of Prince Leopold Island* (Gaston and Nettleship 1981), *The Puffin* (Harris 1984), or *The Atlantic Alcidae* (Nettleship and Birkhead 1985). These authoritative references will reveal that prior to the publication of the first nest-departure model in 1989, mortality rates after nest departure hardly had been considered at all, and certainly not as a potentially critical factor in the evolution of the diverse departure strategies observed among species of alcids. No previous hypothesis about this diversity synthesized such diverse aspects of alcid ecology, emphasized the importance of intraspecific variation, or showed how the well-known seasonal decline in fledging mass or the pre-fledging mass recession observed in many species may be related phenomena. Not to claim too much, I hasten to point out that these predictions were de-

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rived largely by applying a growing body of theory in behavioral ecology to the excellent and extensive data on the Alcidae assembled in the above books.

Gaston (1998) is suspicious about the model's "good fit with empirical observations." The history of science teaches us, however, that the other part of Gaston's opening statement—that the observations "otherwise are difficult to explain"—is as important to scientists in evaluating a model. Although perhaps a fluke, these models at least have the virtue that they provide possible explanations where previously there were none, and as yet there seems to be no strong competing model.

Nonetheless, I would not wish to defend this particular model too vigorously. In the longer run it will have to be evaluated empirically. I disagree, however, with the implication made in the closing sentence of Gaston's (1998) commentary that elaborations of the model and its predictions should not be made before a better evaluation of the current model is completed. To me, this is as unjustified and shortsighted as would be a charge to cease data collection until a model is perfected. If anything, there would seem to be a greater role for modeling in seabird studies than has been the case in the past. Both data and ideas are needed for progress in our discipline, and often we need to struggle to understand new ideas, as well as new data. As the interplay between them often is less-than-straightforward (e.g. Fagerstrom 1987, Ydenberg and Bertram 1989), seldom is a clear prescription possible for what step should be next. In seeking to understand something as complicated as alcid departure strategies, we should explore every avenue of inquiry.

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On Forest-interior Species, Edge Avoidance, Area Sensitivity, and Dogmas in Avian Conservation

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In their search for generality, ecologists often classify species sharing certain life-history characteristics into groups or guilds. Some ecological classifications aim to reflect the influence of landscape structure or habitat fragmentation on species distribution and abundance. For example, species have been classified according to their response to habitat

edges. The preference of certain species for ecotones or edges has long been recognized (reviewed in Robinson 1988). However, the notion that some species strongly prefer the habitat interior is recent. The concept of habitat-interior preference or specialization has mainly been used when investigating potential effects of habitat fragmentation on: (1) the distribution and abundance of plant and animal species (e.g. Whitcomb et al. 1981, Fraver 1994); (2) microclimate (Chen et al. 1993, Young and Mitchell 1994); and (3)

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