

## FORUM

### Anticipatory responses to pulsed resources: an introduction

Vigorous exchange of ideas is an essential part of the business of science. What makes that interaction so much more interesting than ordinary conversation is that, in science, ideas always have to be based on documented observation of the real world. No one disputes that requirement, yet it does not automatically ensure agreement, even when all parties are observing the same bits of the same world. That is because what we see in front of our eyes is powerfully influenced by what is behind them. Observations are never free of assumptions, which in turn are never independent of previous knowledge and experience.

When experienced scientists strongly disagree on an important general idea, the arguments each proposes are often of great interest to many others besides those directly involved. Then it becomes useful to allow the rest of the scientific community to be able to listen in, especially if the issues are more debateable than those that are regularly dealt with during the normal processes of confidential refereeing. That is when the forum format can provide a theatre in which the parties present their cases to the referees who really matter, the members of the scientific community as a whole.

The papers collected together in this Forum discuss a question which meets these criteria well. In species adapted to living on pulsed resources, enhanced fertility and productivity always follow a good season. Within that season, individuals able to anticipate a coming bonanza by breeding earlier or more prolifically than their competitors would clearly have a selective advantage. Can they, in fact, do that? Stan Boutin argues that some animals can respond before the extra resources become available; Tom White replies that any such

response would be physically impossible. Both have, with their colleagues, published their views before in various places. The aim of this Forum is to allow each to provide a succinct summary of the two sides of this debate.

Readers are invited to ponder the general questions raised, especially those which may apply to any such disagreement:

- (1) Both sides may be right, if one is referring to a general argument applying to many species, and the other to one or a small group of valid exceptions.
- (2) All models require assumptions, which may or may not be correct for the species for which they were designed. Furthermore, all models are necessarily incomplete, and species vary widely in which parameters (physiological, behavioural, etc.) are the key drivers of any response. Even when correct for one species, a model may be inappropriate for other species. Carefully controlled data on real animals commonly include surprising results not predicted by any model. The literature can easily supply examples of species living on pulsed resources in which the longest-lived adults (i.e. with most future chances of breeding again) are those born in the bad years, not the good ones. And the fate of the extra juveniles produced in good times cannot be assumed to be improved by the extra resources if the resources are already fast disappearing by the time those juveniles are independent. Conclusions derived from any model may just retrieve its own assumptions if there is no provision for counterintuitive results.

- (3) All arguments must be fully compatible with current understandings of the evolutionary biology of reproductive effort. for being willing to contribute their thought-provoking discussion to our pages.

The *New Zealand Journal of Zoology* editorial team thanks Tom White and Stan Boutin

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