Inaction ≠ caution: response to Larson, Kueffer, and the ZiF Working Group on Ecological Novelty

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We thank Larson et al. [1] for their response to our recent article in TREE [2] and we certainly agree that great uncertainty surrounds scientific understanding of the many impacts of invasions. Indeed, much of our paper stressed the complexity and frequent subtlety of invasion impacts. That invasion science has made great strides in understanding effects of introduced species in no way downplays the difficulty in understanding the full gamut of impacts. Neither did we advocate silence about uncertainty. It is misleading, however, to state, as Larson et al. [1] do, that we ‘propose that the proper role of scientists is to educate the public about these negative effects...’. We did say that ‘scientists are well positioned to elucidate the complexities of invasions,’ and we concluded that ‘their proper role as scientists...is to educate citizens in a way that informs debate within society about how to think about and manage invasions.’ Of course, such education includes frank acknowledgment of uncertainty. In fact, we are in complete accord with Larson et al. [1] that scientists should strive ‘to portray the range of possible actions associated with prevention, early detection and management, and – to the extent possible – to indicate the associated uncertainties.’ We thought that it was clear that this was precisely what we were advocating.

We should not overstate our inability to predict impacts, however. We did not acknowledge, as Larson et al. [1] claim we did, that ‘the accuracy of our present weed risk assessment systems is “usually insufficient”.’ On the contrary, we said, in Box I in [2], that stringent biosecurity based on risk assessment, as applied in Australia and New Zealand, has significantly reduced the number of invasions, and we nevertheless argued that the way forward includes still better risk assessment procedures. The continuing improvement and already substantial value of risk assessments for species introductions is widely recognized (see, e.g., [3,4]).

Larson et al. [1] seem uneasy at the thought of action in the face of uncertainty, and they appear to see inaction as ‘caution’. We do not agree. Of course, any decision-maker would wish that outcomes of various potential courses of actions are completely specified. However, most societal decisions are made without full knowledge of the consequences they will entail; this is as true for policies and actions in foreign affairs, economics, healthcare, education, and any area of resource management as it is for actions with respect to introduced species. We are forced to act, if only because failing to act is also an action, and such failure to act is not generically more cautious than acting. Of course, decisions on actions should be case-specific and based on the best knowledge available, even if that knowledge is sparse. However, there is nothing inherently cautious about doing nothing in the face of a small patch of a recently introduced plant or a pond with a population of an introduced fish. As in some other arenas, doing nothing can also result in very abrupt and damaging changes: introduced populations can spread rapidly, sometimes after quiescent lags during which they appear innocuous [2]. It is neither irrational nor illegitimate for society to decide to act aggressively in a situation in which failure to act could conceivably lead to a very bad consequence, even if the likelihood is low or the probability uncertain. This is the very spirit of the precautionary principle.

We reject the contention that we sow confusion by defining impact neutrally, as any significant change, regardless of its perceived value to humans. In fact, we avoid confusion by being explicit. We suspect that the ongoing attempt by Larson et al. [1,5] to police the vocabulary of conservation science communication will be futile. In addition, we stand by our claim that the spread of invasive species is, in fact, ‘reminiscent of armies moving’. This is precisely why military metaphors abound in descriptions of invasions, as in public health, and it is unlikely that scientists or the public looking at maps of the spread of invasions will fail to see the resemblance. This argument is well-worn (e.g., [5,6]) and need not be repeated here.

References

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