

## **“Newcomers” Invade the Field of Invasion Ecology: Question the Field’s Future**

Rejmánek et al. (2002) recently critiqued a nomenclature scheme for invasion ecology we had proposed (Davis and Thompson 2000). They stated that we tried to change the field’s terminology “in response to governmental policy statements,” an attempt, they said, that “probably has no precedent.” Specifically, they described our effort as an attempt to make the terminology “concordant with the definition in an Executive Order of one country’s President.” They also stated that we believe “invasion always implies some sort of impact, and all “invasive” taxa are harmful.” There is no truth to these statements.

Rejmánek et al. did not cite the original paper (Davis and Thompson 2000), in which we made our nomenclature proposal. In this paper, we did not refer to any executive order or any

public policy issue; nor did we address in any way communication between scientists and the general public. Our proposed nomenclature was conceived, written, and justified entirely as a way to improve communication and research *within* the scientific community.

Rejmánek et al. confused our proposed operational definition of the word “invasion” with the phenomenon of new species coming into a region. We developed our proposed nomenclature on the explicit recognition that some new species “have a negligible effect on the new environment, whereas some have a very large impact” (Davis and Thompson 2000). We proposed that usage of the word “invasion” be confined to those circumstances in which the newcomers have a large impact on the community, ecosystem, or economy. Our operational definition, as we presented it, is completely neutral as to whether the impact is deemed helpful or harmful by humans.

We brought up Clinton’s Executive Order in a subsequent response on this issue (Davis and Thompson 2001) as an example of the extent to which the nonscientific and scientific communities differ in their use of such words as “invasion” and “invader.” (President Clinton’s Executive Order on Invasive Species [Order 13112, 3 February 1999] defines invasive species in terms of *impact*: “invasive species means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.”) We pointed out in our response that, in addition to its benefits to scientists working within the field (our sole emphasis in the original paper), our proposed nomenclature system also might be helpful in our communication with nonscientists. Even though we never considered the latter possibility in preparing the original paper, it is certainly true that ecological issues are now commonly and directly addressed in national-scale policy discussions, and it would seem to behoove ecologists to reflect on whether the language we use enhances or detracts from our ability to communicate effectively with nonscientists. Others have made this same point in other contexts. For example, in their recent review of the definition and

use of the term “ecosystem,” Pickett and Cadenasso (2002) emphasize the importance of using terms and language that can facilitate “general communication within the domain of science and with the public at large.”

As emphasized by Pickett and Cadenasso (2002), ecological terms mature and change over time. For example, the term “climax,” which was widely used and accepted by plant ecologists for a good part of the 20th century, has fallen into disfavor in recent decades due to new findings and perspectives. The fact that the terminology system used in invasion ecology has been in place since the 1800s, as emphasized by Rejmánek et al. (2002), is hardly reason to sanctify it. If anything, the prescriptive, unyielding message presented by Rejmánek et al. illustrates how resistant the field is to the introduction of new ideas, and to ideas from the “newcomers” that they specify.

The choice and use of certain key terms can foster or hinder development within a discipline. Whether intended or not, the use of terms such as “native,” “indigenous,” “alien,” and “exotic” tends to “reify” (Slobodkin 2001) species into discrete and scientifically unsupported categories, thereby implying ecological or evolutionary differences and/or differences in values (e.g., desirable vs. undesirable) that have little or no scientific basis (Gould 1998, Davis and Thompson 2000, Rosenzweig 2001, Slobodkin 2001). Although these terms may have had some heuristic value to ecologists in the past, current costs, both within and outside the field of ecology, may outweigh the benefits gained from continued use.

Many ecologists have responded favorably to our etymological critique of invasion ecology as well as our critiques of the field from historical (Davis et al. 2001) and theoretical (Davis et al. 2000) perspectives. These have included scientists from Latin America, Europe, South Asia, as well as the United States, together with some geographers and philosophers of science. We take this to indicate that many investigators in the field are hungry for new perspectives, which emphasizes the need for affirming a

pluralistic approach to all ecological research topics.

To most readers, this argument over the usage of a couple of words must seem like a tempest in a teapot. However, there may be more at stake here than just vocabulary. We believe that invasion ecology is largely a pseudo-discipline. By pseudo-discipline we mean a field that lacks any unique scientific focus or justification, but that has developed and maintained a separate disciplinary identity largely as a result of effective promotion and the use of discipline-specific jargon. During the past several decades, the actions of many scientists, granting agencies, publishers, and media outlets have combined to create the perception, both within and outside the field of ecology, that the introduction (and occasional spectacular success) of new species represents an ecologically unique phenomenon, thereby requiring new answers and hence a new discipline to find those answers. (We emphasize that we suggest no collusion or conspiracy of any kind, nor any intent to create this misperception.) Invasion ecology clearly has been a hot area of research in recent years, spawning invasion journals, invasion symposia, special grant initiatives, and countless books and articles on the topic. Yet, despite all this activity, very little progress in understanding the ecology of these new introductions has been gained, beyond that which could already be acquired using existing ecological models and knowledge. We fear that, despite original good intentions, the emergence of invasion ecology as a distinct subdiscipline has hindered more than helped our efforts to understand the ecology of these new introductions (Davis et al. 2001). Paradoxically, ecology may contribute more constructively to society’s efforts to deal with the ecological, economic, and health problems caused by some of these new species if the field proceeds without the language and paradigms promoted by invasion ecology.

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