Comment: Ecosystem services and invasive species management in a changing system

Carl Hershner and Kirk Havens

Center for Coastal Resources Management
Virginia Institute of Marine Science
P.O. Box 1346
Gloucester Point, VA 23062

email: carl@vims.edu
   kirk@vims.edu

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There are many debatable things in the Martin and Blossey comment, and more than a few merit a discussion that exceeds the bounds of this response. In general, we believe they fail to understand the primary thesis of the article: management for ecosystem services must address the potential for invasive species to have increased value in an evolving system. We have argued that in some coastal systems development pressures and climate change have created conditions in which some invasive species are particularly suited for provision of valued services. This circumstance warrants pragmatic consideration among environmental managers.

Our paper is considerably more nuanced than Martin and Blossey acknowledge. In point of fact it does not reject the need to manage certain invaders. The entire point of the paper is the need to avoid the kind of black and white characterizations used in the critique. We argue (repeatedly) for strategic management (actually the heading of one of the opening sections in the paper) that incorporates spatial and temporal variability. To quote from the paper:

We suggest that the differential value of ecosystem services provided by native versus invasive species may not always justify management aimed at eradication or complete control. Recognizing that in some circumstances the cost and efficacy of control is limited (e.g., Pimentel et al. 2000), strategic management of invasive species may involve acceptance of their presence and value in the system. (Vol. 22, No. 3, page 545)

We do not suggest abandoning control efforts that seek to preserve vigorous native communities. But, we do believe informed consideration of the role these non-native plants can play in sustaining valued ecosystem services should be central to management planning. (Vol. 22, No. 3, page 548)
The critique is flawed in assuming it is essential to demonstrate parity between native and invasive community ecosystem services. Our perspective is that invasive communities have the capacity to provide some services, and that is all that is necessary to argue for strategic management. This is particularly true when the system stresses are such that native communities are not sustainable. In these circumstances, invasives may provide an acceptable and potentially desirable alternative.

Martin and Blossey’s statement “...it is premature to conclude that acceptance of invasive species is the only answer” implies a conclusion we explicitly do not reach. We posit:

To the extent that invasive aquatic plants have the capacity to provide certain ecosystem services, and when they are found in settings where those services are valued, the objective of environmental management may not be served by a commitment to eradication. (Vol. 22, No. 3, page 545)

In each case we highlight the modest to poor efficacy of current control efforts and review evidence that the plants have some capacity to provide valued ecosystem services in some settings. On the basis of these case studies, we argue for a paradigm shift from focus on the negative effects of invasive plants on existing static systems to recognition of potential, positive service contributions in a changing system. (Vol. 22, No. 3, page 546)

This small sampling of research on Phragmites provides evidence of the significant capacity of the species to provide water quality and habitat services in some settings. This capability may make the plant a desirable component of some managed systems, particularly in light of its comparative vigor under high sediment and nutrient loadings. (Vol. 22, No. 3, page 548)

Martin and Blossey go beyond the substance of our original article to introduce an argument for a total valuation framework for ecosystem services. This approach has considerable conceptual appeal, but has even greater theoretical and practical limitations that make it generally inappropriate for management decision guidance. The issues are well discussed in the literature, and have been evaluated and synthesized by the National Research Council panel that issued a report in 2005 on Valuing Ecosystem Services. We recommend this as a primer for those interested in the topic.

Literature Cited: