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Book Review

Author's Response to Reviews

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Thanks to Garry Peterson and *Conservation Ecology* for undertaking a joint review of *Taking Complexity Seriously* (TCS) and to the three reviewers for getting to the points so quickly. They are not alone in their issues and concerns. TCS has been reviewed in other journals and, although some reviews have been generally favorable, others mirror the points of the *Conservation Ecology* reviewers. Thus, the following response addresses these general criticisms.

Because I wrote TCS for policymakers and practicing policy analysts such as myself, I take to heart the charge that my approach is far removed from decision-making practice. This view, I think, reflects the fact that the practice of policy analysis has not yet caught up with the new tools available, including my own. For the last decade, I have been involved in widening the policy analyst's tool kit to enable better analysis of policy issues of high uncertainty, complexity, incompleteness and conflict--particularly those revolving around science, technology, and the environment. For these issues, the analyst needs, I argue, new tools, namely narrative policy analysis, triangulation, policy optics, and an understanding of the coupling-decoupling-recoupling dynamic that governs so much of contemporary policy making.

I believe that the identification and use of new policy analytical tools must be driven by small "t" theories. Sometimes, the best practical advice one can give is a little theory, a soil scientist once told me. I am convinced that the tool kit needs more conceptual frameworks to help analysts recast seemingly intractable policy issues in more tractable terms. I hope that ecological analysts would also benefit from a better understanding of how small "t" theories (like the ones that I write about) can help them give conflicted stakeholders better policy advice based on admittedly incomplete findings of complex and uncertain ecosystems. Because the theories and new tools are not yet in the tool kit, the perception of a gap between theory and practice persists.

I also take to heart the cluster of criticisms around what reviewers find to be the meager fare of my findings and recommendations. Like Oliver Twist, they finish my meal by asking for more: More integration of findings, more synthesis of methods, more policy relevance, more concrete answers to "Just-what-should-we-do-to [fill in the blank]?" In TCS, I advocate case-by-case analysis and management of ecosystems and natural resources precisely at the moment the world is going down the tubes because of the big transboundary environmental problems that have to be managed as a whole system. Rome is burning and what do I advise: Save it room by room?!

That is exactly what I recommend. For while the world's ecosystems are being hammered, we simply have no other way to save them except ecosystem by ecosystem. Why? Because the policy and management issues are profoundly uncertain, complex, incomplete and conflicted for any given ecosystem, let alone for all ecosystems all across the planet. Yes, we know why the Aral Sea has been destroyed. Little uncertainty there. But do we really think we know what to do to restore that ecosystem and keep it restored? Do we really believe that even if we did know, the solution would be extendable or generalizable to other aquatic-terrestrial ecosystems? Do we really

believe that even if lessons learned were extendable and generalizable, they would be a major part of case-specific solutions for other ecosystems?

In the same way, across-the-board generalizations, such as "reduce population growth in the south and per capita consumption in the north" cannot be true. Just consider complexity alone, defined in TCS as the increased number of elements in a system, their functional differentiation and their interdependence. Do we really believe that implementing this generalization on a planet of 6 billion people - connected by global natural resource scarcity and separated by innumerable professions, statuses, and distinctions - would not have massive but unknown and possibly irreversible global impacts? I am constantly awestruck by those who insist reducing population growth is the answer while recommending the precautionary principle for everything else.

Undertake a thought experiment. What if next week, a series of Ebola-like cataclysms left human population numbers in the Columbia River Basin, San Francisco Bay-Delta and Everglades at historic 19th century levels for the foreseeable future. Who would be left to pay for massive restoration efforts needed to rehabilitate these ecosystems back to early 19th century patterns? How would we know those remaining would even want to do that as a priority? Isn't it probable that the ecosystems would now be worse off after population levels had been so drastically reduced? Who, for example, would pay to maintain all that high reliability infrastructure--e.g., massive networks of pumping stations--that was used to manage the three ecosystems as ecosystems when there were more people around who wanted these ecosystems managed better? If it takes years to restore an ecosystem, surely it must take years to remediate the socio-economic system that gave rise to the need for ecosystem restoration.

Take a less contentious generalization: Save biodiversity! Who can be against saving biodiversity? As we are constantly reminded, it may contain the cure for cancer! But that's the point, isn't it? Where are the real-time management plans for saving biodiversity as a way to cure cancer? Where are the operational strategies that go beyond, say, working with *Taxus* and Taxol, or some Amazonian plant or the like, to manage biodiversity as a way of reducing the incidence of cancer? It is not enough to say that saving species keeps open possibilities for saving the future. Saving the future means real-time trade-offs, priorities and hard management decisions under persistent budget constraints, precisely the details missing in virtually all calls to save biodiversity.

Yes, Rome is burning and Rome was destroyed. Like Romans, we have few means to save what needs to be saved at the scale it needs saving. Unlike Romans, we have nowhere to flee nor can we let the burning take its course without a fight. The fight, however, means tough decisions: what parts of the city are to be left to burn, because we couldn't save them even if we tried, what parts of the city are we going to let burn even though we could save them, what parts of the city are we going to set fire to in order to better protect what we want to save, indeed just what are we trying to save Rome *for*? These kinds of tough decisions are the focus of our book (Van Eeten and Roe, forthcoming) that examines and proposes new strategies for the better management of the San Francisco Bay Delta, Columbia River Basin, Everglades, and the Green Heart of western Netherlands. The reader who is looking for details will find them there.

One last point. I write about the issues that ecologists have convinced me are full of uncertainties, complexities, unfinished business and conflict that matter the most for our times and the future ahead. They more than any other discipline take complexity seriously. Everything they have informed me about points to the need for case-by-case analysis and management and points me back to starting where I live and work because this is the case I know the best. Indeed, points all of us back to where we live and work as the place to start saving the planet.

RESPONSES TO THIS ARTICLE

Responses to this article are invited. If accepted for publication, your response will be hyperlinked to the article. To submit a comment, follow this link. To read comments already accepted, follow this link.

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