

Box 1. Testable Predictions of the Dual-Response Hypothesis

Cognitive scientists should be able to detect and disentangle human reactions to various canid stimuli as evidence of a dual response. For example, presenting four stimuli associated with aggressive or playful canids in a two-by-two treatment using stimuli unambiguously associated with either wolves or dogs could elicit any of four distinct responses depending on an observer's genetic makeup.

The inherited, biological components of aversion or attraction to canids might be expressed in young children exposed to puppies or dog-like stimuli. One should look for reactions that are instinctive responses (i.e., expressed in functional or mature form at first stimulus).

The relative abundances of dogs and wolves as well as their roles in human society are dictated even today by a sociopolitical negotiation among people of different phenotypes that is mediated by local benefits minus costs perceived by power elites, interest groups, and society at large. Social scientists and ecologists can help to relate current mutualisms to historical patterns of interaction with canids.

different responses to one or both canids were heritable. We predict that humans today exhibit four distinct phenotypes: either pro- or anti- either dogs or wild canids. Our hypothesis makes testable predictions (Box 1). We offer the dual-response hypothesis to help explain the massive ecological influence of dogs today and the repeated local extinctions of wolves and various wolf-like animals, including the Malvinas fox, *Dusicyon australis*, and the marsupial thylacine wolf, *Thylacinus cynocephalus*. The dual-response hypothesis also generates at least three testable predictions for several fields of science (Box 1).

Society and Narrow-Interest Groups

Human-dog mutualism has led to the global spread of dogs [8], with an associated widespread and deep ecological paw print. Meanwhile, wolves have been driven extinct in many regions globally and only legally enforceable conservation efforts during the past 40 years have prevented continental extinctions. Whether wolves vanish or recover will reflect social conflicts over the value of wolves. Narrow-interest groups such as Chile's pro-dog organizations and the US anti-wolf organizations mentioned above can occasionally drive societies into extreme positions on dogs or wolves. Likewise, moderate interest groups may push back against extremes to restore mutualisms with dogs that make sense ecologically and ethically and reestablish a coexistence with wild wolves that makes sense as well. Humanity's dual responses help to explain modern ecological and social conflicts over dogs and wolves.

Acknowledgments

The authors thank the Fulbright Commission in Chile and the Tinker Foundation in the USA for funding mutual visiting professorships (2012 and 2015). They thank the project 'Assessing the Impact of Free Ranging Dogs' (Fondecyt 1120969) and the Center for Intercultural and Indigenous Research (CONICYT/FONDAP/15110006).

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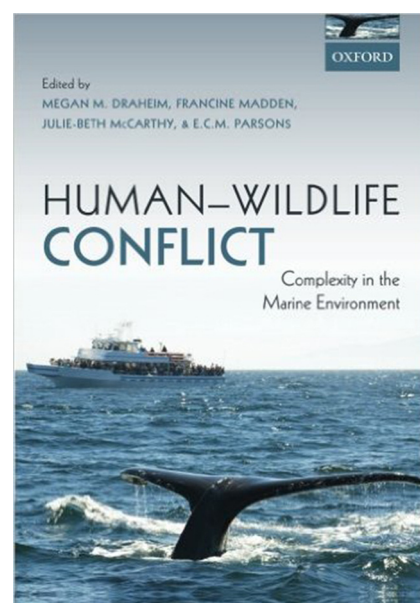
<http://dx.doi.org/10.1016/j.tree.2016.04.006>

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Book Review
Slow Conservation

Joe Roman*



The word 'stakeholder' dates back to the 18th century, when it referred to individuals who held money during financial transactions or bets. During the 19th and 20th centuries, it expanded to include people or companies dedicated to the success of a business or sector. Given the financial roots of the word, it is no wonder that conservationists have eyed the term with suspicion. Can you be a stakeholder for a group of whales or a deep-sea ecosystem? Or do we need a new term?

Stakeholders are at the center of the new book, *Human-Wildlife Conflict: Complexity in the Marine Environment*. How do we address deep-seated conservation

conflicts that can drag on for years? The book brings to life a model developed by Francine Madden and Brian McQuinn for three levels of conflict, ranging from relatively simple disputes, which can typically be settled in court or through material incentives, to established, identity-based conflicts, such as those that have emerged between many fishers and the federal government in the USA (Figure 1). Identity-based struggles are often at the root of environmental problems that have 'gone wicked'; issues that have a high degree of scientific uncertainty and regulatory complexity and can involve decisions that are likely to exacerbate deep-rooted conflicts. To make progress, the authors insist, building relations and a sense of ownership are key, for everything from establishing wildlife sanctuaries to managing wild dolphin swims.

One of the strongest chapters delves into Hawaiian history, unearthing the identity conflicts between Polynesians and European settlers to expose the deep-rooted conflicts that lie beneath Hawaiian monk seal conservation. Although native to the main Hawaiian Islands, the seals have been absent for so long that they do not appear in oral traditions. Unlike sharks and turtles, with strong traditional significance, monk seals have become associated with outsiders, that is, non-native Hawaiians, particularly those who work for the federal government. Changes are necessary on

all levels, say the authors, from casual interactions between seal volunteers and native Hawaiians to the incorporation of traditional cultural values to create positive associations with the reestablished pinnipeds. A recent study in *Conservation Biology* supports these claims: more than half of successful recovery plans for mammals had broad stakeholder agreement; less than a quarter succeeded with weak agreements [1].

An equally memorable chapter, 'Transcending Boundaries and Encountering Flamingoes', shows how a proposed expansion of a protected area exposed underlying conflicts of race, class, and wealth in the Bahamas. Land-tenure systems were tied to slavery, when blacks were sold as property, and many black Bahamians see proposed conservation laws as an extension of white land holdings. So colonial history, and the neocolonialism of tourism, was at the core of the conflict over a new protected area. Conservationists might have hurt their cause by basing some of their meetings at a private hunting and fishing camp in the park. At the same time, the lawless reputation of the island, dating back to a resistance to slavery and piracy, but also reflected in modern-day drug trafficking, frustrated some resource managers.

One of the goals of this book is to inject new concepts into old conflicts, such as the controversy over Japanese whaling. Does it succeed? A few ways of mitigating conflict are highlighted, like bringing parties together early in the process. Practical steps, such as having a thoughtful facilitator (a neutral third party with the skills to build relations) are vital in making the participatory process effective. I have seen the value of facilitation during my time on the North-east Regional Ocean Council in the USA. Our facilitator gave ample time to members of the council and parties such as fishers, researchers, and environmental groups. When members of the public felt isolated by standing at a microphone across the hall, the room was reconfigured. Everyone

wishing to speak was seated at the table, giving them the same status as the council members. It remains to be seen if such small steps, combined with a large vision, will be enough to create workable solutions.

Traditional conservation efforts, such as coastal zoning, compensatory payments, and wildlife laws, often fall short of the transformative processes necessary to reduce conflict. So what does this transformation look like? The devil is in the process of decision making and reconciling fractured relations. Embrace the conflict, rather than avoid it. Rushed processes lead to lawsuits and hostility. Although there was little evidence of this transformation in the book (many chapters analyze the conflict rather than propose concrete recommendations), the payoffs of time invested and skilled facilitation are seen in a few instances, such as curbing illegal fishing in the Bahamas.

Approaches led by expert-driven science, notes Jill Lewandowski of the US Bureau of Ocean Energy Management, can come at a cost. By ignoring social values, equity, and justice, and by emphasizing 'hard' science, conflicts become more intractable, or wicked. In addition to biological studies, research on stakeholder values and the positions of different parties is needed to shed light on the reasons behind the conflict. As Madden notes, we are at the dawn of integrating psychology, anthropology, neurology, and behavioral economics into conservation.

The well-written chapter on religion shows that incorporating local beliefs can help conservationists entwine spiritual and natural heritage, an approach that can outlast policing and transcend the narrow confines of stakeholder interests. In India, the whale shark, once known as the 'barrel fish' for the plastic buoys used to hunt it, was rechristened Vhali, or 'loved one' in Hindi. It is now revered along the Gujarat coast. After replicas of cherished icons of Jesus and Mary were placed on a coral reef in the Philippines, illegal dynamiting stopped. No

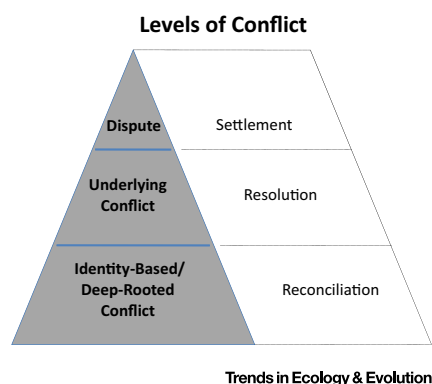


Figure 1. The Three Levels of Conflict and Processes Needed to Address them. Reproduced, with permission, from [2].

one wanted to blow up the baby Jesus. Saving the marine environment requires patience and perhaps a prayer.

Human–Wildlife Conflict: Complexity in the Marine Environment edited by Megan M. Draheim, Francine Madden, Julie-Beth McCarthy, and E.C.M. Parsons, Oxford University Press, 2015. US\$59.95/£34.99 pbk (224 pages) ISBN 9780199687152.

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<http://dx.doi.org/10.1016/j.tree.2016.04.008>

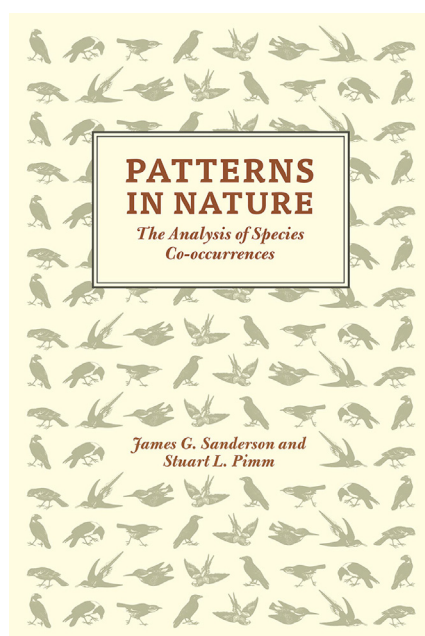
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Book Review

The Formidable Challenge of Answering Simple Questions in Community Ecology

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There is an enduring tension in ecology between the search for generality and our propensity to see patterns everywhere. Assessing the extent to which ‘obvious’ patterns differ from what might be expected by chance alone has been at the centre of one of the most heated of ecological debates. First, the pattern: Diamond’s [1] observation that certain pairs of similar bird species coexist only rarely on the same island, something that he ascribed to competitive exclusion in his set of rules for the assembly of communities. Then, Connor and Simberloff’s counter-assertion [2] that these patterns could be explained simply by randomly placing species onto islands. No need for competition, no need for rules. This difference in views grew famously ugly, but the central ecological question (what can we infer about mechanisms of coexistence from patterns of species co-occurrence?) and the associated technical challenges (what sort of patterns would we expect in the absence of any such mechanism? How can we best compare reality to this null expectation?) continue to stimulate considerable thought. In their clear and entertaining new book, Sanderson and Pimm review the intellectual content of this debate, restate their own solutions to the two technical challenges, and consider the developing mutualism between natural historical understanding and computational methods.

Sanderson and Pimm are firm in their belief that patterns of coexistence remain fundamental to community ecology; but, more generally, this book is a paean to the well-stated null, relevant to all branches of ecology in which experimental manipulation and extensive replication are impractical if not impossible. Most of us working in such fields will agree with them that ‘...building sensible null models turns out to be fiendishly difficult’. Simply put, the extent to which a null should be constrained to resemble reality is not obvious; and even when that decision has been made, one is still left with the task of constructing and sampling from the universe

of possible nulls. The authors illustrate these problems in the specific case of island incidence matrices, where the presence or absence of a species on a particular island is represented by a 1 or a 0. It is some achievement to have made this section so readable and fascinating. The conclusion is that Miklós and Podani’s [3] trial-swap algorithm has rendered the generation of random incidence matrices a solved problem.

Having satisfied themselves that they can effectively generate ‘random’ communities, Sanderson and Pimm then turn to the issue of how to compare reality (the observed incidence matrix) to the null? Here, the metric is key, and the authors come down firmly on the side of using pairwise rather than community ensemble metrics, which they consider to needlessly obscure unusual pairwise patterns: ‘Why is it that the full richness of nature... must always be boiled, distilled, spun and precipitated into a single number?’ This seems sensible, even if their description of how to identify ‘unusual’ pairs of species, and their subsequent worked examples, lack some of the clarity of earlier sections. Equally, the final chapters extending the preferred approach to analysis of species coexistence along environmental gradients, and to interactions within ecological networks, feel rather superficial compared with the earlier substance; yet even here, the book provides a useful source of testable hypotheses.

The book is not without faults. Although the text has obviously been carefully crafted for clarity, the same cannot be said of the figures and tables; and the prose, so lucid when describing methods or concepts, labours over numerical results: for example, ‘This number of co-occurrences or more occurred in all but 989,090 of the one million null matrices’ would surely be better phrased as ‘in just 1% of the null matrices’. It is also important to state what the book is not. Although the brisk review of many of the key texts in community ecology, particularly from the 1970s