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# Science Driven Restoration: A Candle in a Demon Haunted World—Response to Cabin (2007)

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## Abstract

Cabin (2007) asks whether formal science is an effective framework and methodology for designing and implementing ecological restoration programs. He argues that beyond certain ancillary benefits, restoration science has little of practical value to offer the practice of restoration. He goes on to suggest that restoration science most often represents an impediment to restoration practice because an “ivory tower” mentality limits the utility of experiments and diverts research dollars away from answering practical questions. His conclusion is that a nonscientific gardening approach may be more effective at restoring degraded ecosystems. We disagree with this perspective because: (1) restoration science has moved beyond exclusively using “square grids” placed on small patches of land to examine treatment effects on species representation; (2) Cabin’s critique greatly undervalues the contribution of science to restoration practice even where the

input of restoration scientists is not directly evident; and (3) the practice of restoration is unlikely to advance beyond small-scale and truly haphazard successes without well-designed studies that can provide peer-reviewed and widely accessible published information on the mechanisms underlying both successes and failures. We conclude that through integration with other disciplines, restoration science increasingly will provide novel approaches and tools needed to restore ecosystem composition, structure, and function at stand to landscape scales. As with the broader role of science in the human enterprise (Sagan 1996), the contribution of restoration science to restoration practice can only grow as the discipline matures.

**Key words:** ecological restoration, ecosystem function, forest restoration, Hawaii, landscape restoration, restoration practice, restoration science, tropical dry forest.

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## The Conflict and the Critique

Restoration science is a young but rapidly evolving discipline that seeks to address some of the world’s most pressing and complex ecological problems. Expanding human populations, growing numbers of problematic invasive species, and climate change conspire to make the challenge of restoring species assemblages and ecosystem processes in highly degraded landscapes all the more daunting. Recognizing these facts, the restoration scientist is tasked with asking meaningful questions that in the answering will yield site or condition specific information that is also broadly relevant to restoration practitioners, defined here as those implementing restoration prescriptions.

Based on a narrow working definition of science, Cabin (2007) argues in a recent *Restoration Ecology* editorial

opinion piece (vol. 15, no. 1, pp. 1–7) that beyond ancillary benefits of heightened prestige, increased visibility and some extra funding for ecological restoration, restoration science has little practical to offer restoration practice. He suggests that disciplinary pressures to publish in prestigious journals and funding agency preferences for experiments that are scientifically rigorous and elegant combine to reinforce a disconnection between restoration science and restoration practice. We support Cabin’s effort to stimulate debate on whether the discipline is achieving self-stated goals. However, we believe that his critique is flawed because: (1) his view of restoration science is too narrowly defined; (2) he projects unfounded personal doubts about his own restoration science experiences; and (3) he has unrealistically high expectations for how quickly and completely restoration science should be able to inform restoration practice.

## A Broader Definition of Restoration Science

Restoration science may be defined as the process through which scientists provide practitioners with the “clear concepts, models, methodologies, and tools” needed to support ecological restoration (SER 2004). Cabin defines this science as consisting of “square grids” placed on small patches of land with the goal of understanding treatment effects on species representation. However, restoration science now

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