

INTRODUCTION ARTICLE

# Restoration dialogues: improving the governance of ecological restoration

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Ecological restoration activities should be conceptualized as a form of governance, as this lens best captures the multiactor, collaborative processes by which societies through governments and nonstate entities seek to achieve environmental outcomes. Successful restoration governance depends on addressing a cluster of challenges concerning optimal spatiotemporal scales, biological feasibility, sociocultural acceptability, financial viability, and institutional tractability. Changes to private law, company law, and taxation are some of the governance reforms available to tackle these challenges.

**Key words:** biological feasibility, governance, institutional tractability and financial viability, scale, sociocultural acceptability

## Implications for Practice

- Ecological restoration is a social activity, as against merely a scientific endeavor, and this necessitates practicing restoration as a form of societal governance.
- Law is a critical framework for restoration governance, but operates in conjunction with other forms of governance including community participation and market financing.
- Successful restoration projects, while informed by overarching ecological principles, must be tailored to local places and contexts due to the need to incorporate social, economic, and institutional variables relevant to success.

## From Dialogues to Governance

What does “governance” have to do with ecological restoration? This leitmotif emerged from the “Restoration Dialogues” symposium convened by the University of Tasmania in Australia, on 3–4 November 2015, whose papers make up this issue of *Restoration Ecology*. Assembling 50 global participants from scholarly theorists to community practitioners, including luminaries Richard Hobbs and Emma Marris, the event featured case study “dialogues” pairing academics and nonacademics. Drawing mainly on Australian examples, the symposium aimed to transcend the disciplinary fragmentation of knowledge in this field, test the validity of theoretical principles against place-based experiences, and clarify criteria for successful restoration. These dialogues revealed limits to general theories of restoration ecology—such as in regard to “novel” ecosystems, at one extreme, to rewilding, at the other—as much depends on local context including actors, available resources, and institutional traditions.

As symposium organizers, we chose “dialogues” to convey that ecological restoration is not just about applying scientific know-how; it also involves reconciling value judgments, navigating contested theories and methods, wrangling over terminology, resourcing economic costs, management succession, and

balancing winners and losers. Academic models for restoration that succeed in one context may not flourish in another, albeit without modification. Successful restoration needs participatory and critical dialogue adapted to the particularities of place rather than proceeding from homogenous theoretical blueprints (Egan et al. 2011).

Ultimately, “Restoration Dialogues” concluded that conceptually the foregoing dynamic is tantamount to a form of societal governance. By “governance,” we mean not simply the official regulation of restoration, but rather a wider, multiactor process by which societal norms, knowledge, and institutions serve to mediate and advance their collective interests toward desired goals (Thakur & van Langenhove 2006). “Governance” is useful to conceptualize restoration as it captures the diverse stakeholder and interdisciplinary endeavor, combining public and private actors and resources wielded for long-term action. Modern governance in a variety of environmental policy contexts increasingly supports this view (Gunningham & Grabosky 1998). The governance framework is analytically useful for highlighting who gets to make decisions, their criteria and processes of accountability.

The conclusion that emerged from “Restoration Dialogues” was that successful restoration governance requires simultaneously addressing questions of scale, scientific knowledge, sociocultural context, financial resourcing, and institutional tractability, which together can best lead to long-term stewardship of a restored ecosystem. These conclusions arose informally from the presentations and debates among the 50 participants, drawn mainly from Australia but with representation from the United

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States and New Zealand, and were ratified at the conclusion of the symposium by its roundtable of distinguished panelists. The relative importance and interactions between these criteria for success vary with contexts, such as between places under public and private control. Restoration in the former, as in the oceans (Vince & Hardesty 2016) and Antarctica (Raymond & Snape 2016), elevates the state to a preeminent position whereas in the latter, such as Aboriginal lands (Godden & Cowell 2016) or agricultural property (Curtis & Lefroy 2010; Lindsay 2016), governance depends on more collegial and grassroots approaches. The next section distils key governance challenges for ecological restoration.

## Governance Challenges

### Aligning Governance With Scales

The sheer scale of ecological restoration, both spatially (expansive land and seascapes) and temporally (from deep past to distant future), is a formidable obstacle to its governance, as verified by some other case studies (Gómez-Baggethun et al. 2013; Wyborn & Bixler 2013; Cohen 2014). The typical forms of *environmental* restoration mandated by legislation, such as to remediate a former mine or contaminated brownfield, function within discrete temporal and spatial boundaries (e.g. U.S. Comprehensive Environmental Response, Compensation and Liability Act 1980). By contrast, restoring ecosystems dramatically enlarges the scale to govern (Bowman & Legge 2016). As the scale enlarges, it may require involvement of multiple levels of government, in addition to participation by more non-government entities—which engenders challenges identified in multilevel governance theory in regard to more complex negotiations, introduction of rival policy goals, and difficulties in coordination of many actors (Winter 2006; Weibust & Meadowcroft 2014). Because reclaimed ecosystems may need stewardship over decades or longer (Jones & Davidson 2016), they require multigenerational efforts for which obstacles arise in motivating initial effort and ensuring accountability for final outcomes (Manning et al. 2006). A further temporal challenge ensues from trying to prioritize restoration as a social goal, as it departs from the dominant short-term temporal orientation of much environmental governance. Mitigating *new* environmental impacts, rather than remedying previous ones, is worldwide generally the focus of environmental legislation (Richardson 2016a). Addressing ecological restoration requires restaging governance on much more expansive time frames that look both to the distant past and long-term future.

The physical scale of restoration also requires complex coordination across diverse, numerous tenures (Jones & Davidson 2016; Martin 2016). Restoration presently has more developed governance frameworks in spatially isolated contexts such as remediating a former mine or waste dump, or cleanup operations at Antarctica base stations (Raymond & Snape 2016), unlike the challenges of vast oceans contaminated with plastic debris (Vince & Hardesty 2016) or even coordinating water uses in a wetland estuary sustained by a large catchment (Gardner & Jensen 2015).

The foregoing considerations necessitate governance mechanisms being tailored to different scales of restoration. Noncoercive, private law techniques may dovetail with expansive landscape restorations on private property (Lindsay 2016), whereas remediation of a contaminated brownfield is better targeted with rules that discipline companies to pay the costs (Richardson 2016a, 2016b).

### Biological Feasibility

Ecological restoration should be initiated only when it is biologically feasible. Some degraded environments have shifted to an alternative equilibrium from which prior conditions seemingly cannot be reestablished. This hysteresis effect shows in some Australian marine waters where invasive sea urchins have destroyed the kelp forests, which have since shifted to barren wastelands unable to recover even after removal of urchins (Johnson et al. 2016). Even where ecological upheavals might be reversible, there can be much wrangling over the choice of historical baseline to recover (Marris & Rohwer 2016). In New Zealand, for example, with massive avifauna extinctions, should that benchmark be when Europeans colonized, in the early 1800s, or just before the first Polynesians arrived around 1200 AD (Pech & Maitland 2016). Alternatively, should baselines accommodate anthropogenic influences? This would seem essential in landscapes inhabited by Indigenous peoples, such as Australia with some 50,000 years of land management particularly through use of fire (Bowman & Legge 2016). At the other extreme, in degraded ecosystems the question of biological feasibility may simply hinge on reestablishing desirable ecological functions and resilience. The efficacy of the dingo, an introduced carnivore, in controlling invasive meso-predators in the Australia outback is one context where the latter debate arises (Johnson & Wallach 2016). Whether restoration projects can simply focus on reestablishing vegetation with the expectation that target animals will recover or whether an animal-centric approach is necessary is a seminal issue (Johnson & Wallach 2016; Jones & Davidson 2016). The implications of climate change for restoration practice is a further dimension of biological feasibility (Harris et al. 2006; Jones & Davidson 2016). In sum, there are some significant points of contention among scientists on the goals and methods of restoration.

The foregoing has consequences for environmental governance, such as codifying standards to which restoration projects will be accountable (SERA 2015). The legal mandates or procedures to restore ecosystems are not normally couched in regard to conditions about biological feasibility, with such matters typically left to be resolved in the discretionary powers of governing agencies (Aronson et al. 2011). Governance processes need to support scientific research, allow for its testing, and provide mechanisms to adjudicate differences and modify principles to take account of local contexts. Because of scientific uncertainty in some situations about the environmental conditions being restored and how they might respond to human interventions, adaptive flexibility should also be incorporated into governance regimes to allow for experimentation and adjustment rather

adherence to rigid blueprints (Gunderson & Light 2006; Voß & Bornemann 2011; Runhaar et al. 2016; Tatenhove et al. 2016).

Another implication is that governance processes are needed to support monitoring of environments being restored both in order to verify that restoration programs are being successfully implemented and to convey information to stakeholders such as local communities and funders as a means of maintaining their engagement and support in the stewardship of restored places. As “governance” is much more than official legal processes of government, we should recognize communities as important partners in the scientific management and monitoring of restored environments. In some cases already, communities are taking the initiative to set up and manage environmental monitoring of restoration projects (Jones & Davidson 2016),

### Sociocultural Acceptability

Aligning restoration science with its cultural context is not simply a challenge of reconciling different methodologies, because the science itself is often hotly disputed. The quarrels rage over not only basic goals as to whether we should be faithful to some historical nirvana or be resigned to maintain novel but functional ecosystems (Hobbs et al. 2013), but also over choice of terminology (Marris & Rohwer 2016). Thus, the challenge is not just one of “consulting,” “engaging,” or “mobilizing” local communities as “stakeholders” in restoration (Egan et al. 2011). Communities themselves may need to be intimately involved in the very inception and design of restoration projects including choice of goals and governing principles (Bradby et al. 2016).

In this way, the focus may extend restoration practice from a mainly quantitative activity—e.g. replanting trees or culling invasive pests—to also a qualitative process that seeks to restore human affinity with nature and foster its stewardship (Marris & Rohwer 2016). Although many people might seem apathetic about nature and indifferent to its reclamation, Buettel and Brook (2016) see opportunities through new technologies to cultivate biophilic tendencies. Empowering Indigenous peoples through recognition of their land and resource rights is another relevant strategy, especially because Indigenous environmental knowledge itself facilitates restoration (Godden & Cowell 2016). In Australia, this is particularly important given that 22% of the country is under Aboriginal control and a further 9% subject to some Aboriginal use rights (Altman & Markham 2013).

There are other reasons why people matter in restoration (Egan et al. 2011). Its success usually requires community support, especially where residents may have to coexist with large carnivores such as Australian dingoes that may compete for resources (Johnson & Wallach 2016), or wolves as in the United States (Hamann 1997). In some cases, local people might even lose their economic livelihoods (Bright et al. 2002). The environmental governance principle of *intra*-generational equity is relevant to decisions that have social inequities in the distribution of the costs and benefits, and requires that they be equitably apportioned with compensation to losers (Voinovic 1995). Furthermore, ecological restoration is labor intensive, with some projects conscripting numerous community helpers on the ground, often for many years, such as in rural landscape

restorations in Australia (Martin 2016) and community-run sanctuaries in New Zealand (Pech & Maitland 2016).

The implications of the foregoing are foremost the need for robust procedures for public consultation and participation in governance frameworks for restoration (Richardson & Razaque 2006). In addition, governance needs to empower communities and NGOs to take the initiative, especially when governments lack the political will to do so. The proliferation of voluntary restoration initiatives in Australia (Godden & Cowell 2016) and New Zealand (Butler et al. 2014) verifies the capacity of the nonstate sector to be a crucial means of restoration governance in its own right, although its capacity to make a difference often depends on access to financial resources (as the next section of this article considers). There is also the possibility of state–nonstate partnerships and multistakeholder roundtables as a means of environmental governance, which help combine the strength of both government and civil society (Schouten & Glasbergen 2011).

### Financial Viability

Ecological restoration often requires significant capital and labor, especially when toxic contamination must be removed (Raymond & Snape 2016). Three main resourcing sources exist: (1) government expenditure, especially in regard to places under public ownership and control, or private expenditure pursuant to government obligations such as under a regulatory requirement or conservation covenant (Lindsay 2016); (2) voluntary philanthropic money such as to support community projects (Jones & Davidson 2016), and (3) commercial approaches such as selling biodiversity and carbon offsets or ecotourism opportunities or even altruistic gestures of corporate social responsibility (Richardson 2016a, 2016b). Assuming such costs are justified—a matter of great importance for criteria (2) and (3)—who should pay for this and how?

The first option is increasingly unviable because of contraction of public funding (Bhattacharyya 2015) and the limited efficacy of coercive approaches to restoration except where actors are directly liable for the damage to be repaired. Philanthropic support available for restoration is nowhere near sufficient to meet need, but could be expanded by reforming taxation law to boost financial incentives for donations to environmental causes (Richardson 2016a, 2016b). In addition, more public education about the immense value of ecosystem services to human wellbeing, and indeed survival, should help increase philanthropic support (Smith 1995). Largely untapped is the commercial sector, but its involvement depends on restoration paying for itself through the market (Richardson 2016a, 2016b). Business corporations could commit large financial resources to support restoration work, thereby overcoming the limitations of philanthropic altruism or regulatory compulsion. However, there are substantial market disincentives for such business initiative because of market failures to reflect the economic value of environmental improvements (Vogel 2006), as evident in the business collapse of Earth Sanctuaries, Australia’s first public company dedicated to wildlife conservation and recovery (Aretino et al. 2001). Corporate law is also an obstacle

to commercial approaches to the extent that it gives latitude for decision-making that is driven by short-term market expediences rather than the long-term public interest.

### Institutional Tractability

Institutional tractability refers to how mechanisms of governance dovetail with the existing machinery of governance, and are thus potentially more efficacious. To lay people, “governance” is typically associated with law enacted by governments, but this is misleading as much societal “governance” also derives from other processes and actors including market forces and community pressure (Holley et al. 2012). Nonetheless, official government law often remains highly important. Its preeminence owes to its respect and legitimacy, its coordinating capacity, its sanctions-backed power, and its administrative apparatus (Summers 2006). “Restorations Dialogues” canvassed the role of law in many contexts, such as regulating private land management (Lindsay 2016), empowering Indigenous land use (Godden & Cowell 2016), and coordinating action internationally to remove ocean plastic debris (Vince & Hardesty 2016) or remediate Antarctic waste dumps (Hodgson-Johnston et al. 2016).

The contribution of law to restoration practice is diverse. It sets standards for governments and promotes international cooperation (Akhtarkhavari et al. 2016). It facilitates restoration that requires complex coordination of activities and actors across diverse tenures in large landscapes (Gardner & Jensen 2015; Martin 2016). In areas managed by governments, such as national parks, public legal duties may help create political expectations that can influence executive government action as well as enable oversight and enforcement of such obligations by courts (Telesetsky 2013). Law also enables the other preconditions of restoration discussed in this article to flourish: it can codify the best scientific knowledge into enduring restoration standards; it can structure procedures for community consultation to help restoration attain social support; and it can help mobilize financial resources and incentivize action, such as through tax breaks (Richardson 2016a, 2016b). In sum, the law can give ecological restoration traction in the machinery of government.

By the “law,” we should count not only official legislative and judicial processes but also the significant contribution of nonstate actors to restoration governance. Growing literature charts the trend from state-based regulation toward societal forms of governance in which nonstate actors such as the business sector, civil society groups, and Indigenous peoples play influential roles under the auspices of or even challenging the state (Gunningham & Grabosky 1998). Above the state, international environmental law, including international norms developed by nonstate actors, may also influence governance of ecological restoration (Vince & Hardesty 2016).

The critical issue, of course, is not simply that ecological restoration needs law to allocate responsibilities and set procedures for practice. Rather, it is the types of laws that are used, and that they are relevantly tailored and earnestly implemented. And in some cases, perverse legal rules must be removed, such as rules that restrict use of fire as a vegetation management tool

(Bowman & Legge 2016) or rules that persecute dingoes when they could be a useful apex predator to control pests (Johnson & Wallach 2016).

### Conclusions: Toward Better Restoration Governance

From papers mainly on the Australian experience, “Restoration Dialogues” identified ways to improve restoration governance. As governance is primarily a *process* of making decisions, rather than prescribed outcomes, governance mechanisms should accommodate a diversity of actors, issues, and contexts. The foregoing overview of governance challenges may suggest a variety of ways to improve restoration governance. From the “Restorations Dialogues” symposium, the following were the main ideas identified to improve on the status quo:

1. Environmental legislation worldwide rarely defines “restoration” or similar concepts such as mitigation, rehabilitation, reclamation, or recovery. If a government regulator or private person is obliged to promote or undertake restoration, defining the term(s) in legislation can ensure that the intended form of restoration is undertaken. Clear statutory definitions also provide the means to articulate the goals of restoration and ensure accountability for projects undertaken thereby. Overlooking this distinction can be confusing, waste resources, and engender unsatisfactory outcomes. For instance, rehabilitation of a mining pit may involve replanting exotic plants because those species can best stabilize the soil; but if ecological restoration is the goal, that tree species may be inappropriate because it does not provide the appropriate habitat for native birds (Palmer & Ruhl 2015). Thus, a review and harmonization of terms used in regulations, while probably very difficult to achieve fully, will be helpful to resolve these issues.
2. Because ecological restoration projects can span long periods, often over several decades or longer, governance needs adaptive flexibility to monitor performance and make adjustments. The decision-making, in other words, should not be front-loaded at the initial inception of a project, but include informational tools to monitor performance and management tools to shift activities and roles if performance expectations are not being met. For instance, conservation covenants on private lands being rehabilitated should not be drafted as one-off legal frameworks but include provisions for their renegotiation in light of new information or circumstances, as well as ongoing monitoring of performance. Monitoring mechanisms can also help provide assurance to stakeholders whose support and funding are necessary to foster long-term stewardship of restoration initiatives.
3. The contentious scientific debates and the potential community antagonism to restoration projects require decision-making forums that can stand above the fray, facilitate public participation, impartially consider evidence, and give guidance untainted by political expediences. Public inquires are ingenious institutions that might be well suited to this task, and their use in environmental decision-making in Australia and other jurisdictions suggests that they have

- great potential to give strategic direction to the ecological restoration agenda (Richardson & Boer 1995).
4. Restoration has a significant social justice dimension, whether it is the rights of Indigenous peoples or individual farmers whose lands are targeted for recovery. Successful governance here has several facets including engagement with affected peoples and communities in the inception of projects, respecting the knowledge and cultural values they offer on equal terms with the science, and providing financial compensation or other in-kind contributions where restoration might entail unavoidable adverse repercussions.
  5. The greatest untapped financial resource for restoration is the private sector, and specifically its capacity to use commercial opportunities such as biodiversity offsets, wildlife sanctuaries, ecotourism, and sustainable harvesting of restored natural resources. All of these sources of private support have potential to under perform if left to an unregulated market. The governance challenge here requires inter alia reworking business law frameworks to better incentivize companies and other economic actors to pursue community benefits, in addition to profitable opportunities.

## Acknowledgments

The authors have no conflicts of interest. This publication resulted from the symposium *Restoration Dialogues*, University of Tasmania, Australia, 3–4 November 2015. We wish to acknowledge the financial support from the University's Centre for Environment and Institute for Marine & Antarctic Studies.

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*Coordinating Editor: Valter Amaral*

*Received: 25 February, 2016; First decision: 18 March, 2016; Revised: 22 April, 2016; Accepted: 22 April, 2016; First published online: 3 June, 2016*