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A Policy Analysis Perspective on Ecological Restoration

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ABSTRACT. Using a simple stages model of the policy process, we explore the politics of ecological restoration using an array of examples drawn across sector, different size and scale, and from different countries. A policy analysis perspective reveals how, at both the program and project levels, ecological restoration operates within a complex and dynamic interplay between technical decision making, ideologies, and interest politics. Viewed through the stages model, restoration policy involves negotiating nature across stages in the policy making process, including agenda setting, policy formulation, implementation, and evaluation. The stages model is a useful heuristic devise; however, this linear model assumes that policy makers approach the issue rationally. In practice, ecological restoration policy takes place in the context of different distributions of power between the various public and private actors involved at the different stages of restoration policy making. This allows us to reiterate the point that ecological restoration is best seen not only as a technical task but as a social and political project.

Key Words: *ecological restoration; interests and values; policy cycle; stages model*

INTRODUCTION

As ecological restoration becomes an increasingly important tool in adapting to and mitigating global environmental change, there is growing awareness of the need to develop social science investigations into restoration policy. Although a solid body of literature, especially from within Restoration Ecology, has helped gain insights into the techniques and effectiveness of restoration in achieving certain ecological goals, we have found only few studies that bring attention to ecological restoration as a public policy endeavor, and none that systematize how diverging ecological restoration imperatives may play out through the entire policy cycle.

From a social science perspective, policies are not seen as neutral tools, but the outcomes of power struggles between different interests, which favor certain interests and marginalize others. Such struggles involve negotiation of trade-offs between competing objectives and constituencies and making decisions about the distribution of scare resources among diverse societal spheres (Meadowcroft 2009:335). These negotiations are structured by power relations. To gain insight into restoration policy we need to investigate the effects of these power relations, particularly at the project level. In what follows, we subject ecological restoration to analysis as a policy, using a simple, yet classic model, the so-called stages model of policy making. Viewed through the stages model, restoration involves negotiating nature across stages in the policy making process. This view helps to uncover a politics of ecological restoration, thus providing a more informed understanding of ecological restoration as embedded in wider social and political complexities and interests.

THE POLICY PROCESS

At a general level public policy can be defined as "a course of actions adopted and pursued by a government to solve a problem" (Ham and Hill 1997:6). The term 'policy' can also refer to a specific proposal, a policy, or a series of concrete measures taken by government to address a specific public issue. In this narrower sense, the term 'policy' means a formal authorization, or program of activity, that can be understood as both focused and instrumental and that requires resource allocation. For example, the Swedish Action Plan for Threatened Species allocates responsibility to certain county administrations to devise specific programs and projects to restore habitats for selected species (SEPA 2012). Public policy can thus be explored as both a process, i.e., as a way of addressing public issues that often starts with a declaratory intent to address a specific social problem or achieve a desired state of affairs, and as an outcome, i.e., as a particular policy designed to produce the desired public results.

In the murky world of public policy making, a policy is rarely faced with a given or a single problem, but is best seen as a complex intermeshing of related concerns. Furthermore, policy often operates across scales, for example, linking the international to the regional and local levels. Restoration policy often has to operate in this transboundary context because ecosystems typically transgress administrative borders. Policy is also a dynamic process, influenced by prior decisions yet rolled out in the midst of a web of other policy decisions and their interrelated outcomes. In addition, policy has to be implemented through existing organizational structures, processes, and procedures, which have institutional expression, such as within a particular ministry, with established ways of doing and acting. This not only makes it difficult to identify a clear outcome that can be identified as the policy but brings attention to the fact that policy is made in the context of continuous and deliberate negotiations between groups and interests operating within the public sphere. Thus, although restoration policy is largely developed by Ministries of Environment, they require actions by a range of different sector agents, such as forestry, agriculture, energy,

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transport, and water, which are, in turn, guided by a variety of other interests and governmental instructions. In short, public policy always has an element of interest politics and emerges within ongoing negotiations between various groups, each with different capacity to influence its outcomes. A policy analysis of restoration thus involves understanding interrelated decision making processes that operate across a variety of temporal and spatial scales. Viewing ecological restoration through a policy lens will be used to cast light on how different interests and conflicting values negotiate what is and is not restored, how such restoration is achieved, and with what consequences for both ecological and social processes, in short, how the policy cycle serves as a means of 'negotiating nature' through process and outcomes.

Ecological restoration, understood as "the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed" (SER 2004), has moved to a new prominence on the public policy agenda. Several political actors, including states and international organizations, such as United Nations Environment Programme, have made declaratory commitment to engage in ecological restoration (Nelleman and Corcoran 2010), although implementation activities typically take place at the regional and especially the local levels. Restoration is seen as offering many benefits, including helping to address global environmental change. Climate change mitigation and adaptation policy, for example, is increasingly relying upon restoration through reforestation for carbon sequestration or restoring wetlands for flood protection. It is also used as a way of safeguarding the provision of ecosystem services. Restoration is stressed as a means of achieving the 2020 Biodiversity Targets, the so-called Aichi Targets, including by the European Union (EU; CEC 2011). In addition, it is increasingly seen as important in agricultural policy and in efforts to improve food security, and as a tool for implementing various resource specific policies, for example, the EU Water Framework Directive, whose target is to restore surface waters and ground waters to 'good ecological status' (WFD EC2000/60). Similarly, restoration is widely used a compensation tool in planning decisions as a means to compensate for disruptions to the visual or cultural qualities of landscapes, often bringing in elements of historic practices and a community's sense of place.

Restoration projects can target many different ecological systems or landscapes and be conducted both in urban (Platt 2006) and rural areas. Such activities can occur across a variety of scales, from limited and highly localized experiments and hesitant trials, to remediation of industrial, quarrying, or mining sites, to what are best described as 'mega projects', such as the Kissimmee River restoration initiative in central Florida (Whalen et al. 2002), restoration of the prairies in the USA (Ryan 2000), or contemporary water management initiatives in the Netherlands (Drenthen 2009). Projects can also involve the deliberate reintroduction of species that have

been lost or made existent at the local level because of changes in land use and other development pressures. Wolf reintroduction policies form a typical example, restoration initiatives that have led to controversies in both Scandinavia and in North America, not least because of local concerns about potential loss of livestock (Gross 2008). River restoration is another focus of project attention, involving the removal of dams, river remeandering and rebouldering (for example, in Sweden, see Lejon et al. 2009), 'daylighting' of culverted rivers, or ecological remediation of urban river banks (for example, in the UK, see Eden and Tunstall 2006).

THE STAGES MODEL OF POLICY MAKING
The stages model of policy making provides a method of examining the operation of the public policy process. This classic model breaks down policy making into a series of discrete stages that sees decisions made in a series of sequential phases, starting with the identification of a problem or issue, and ending with a set of activities to solve or deal with it. These stages are divided into agenda setting, policy formulation, policy implementation, and policy evaluation, respectively (Lindblom 1968). Each stage can be analyzed separately and the resulting sequence of stages is referred to as the policy cycle. In what follows, we disaggregate the policy cycle as it relates to ecological restoration policy. However, following Ham and Hill (1997) real world policy making rarely takes places in such text book fashion, allowing the stages to be distinguished sequentially in policy practice. Instead, we use the stages model as a heuristic devise, to point out how restoration becomes subject to interest negotiations and to explain how restoration outcomes are the result of the play of power and politics in such settings.

Even in societies where there is broad agreement about the need to manage or conserve nature, there is negotiation at the early, agenda setting stage about how the problem of ecological restoration is framed, particularly, but not exclusively, at the project level (Table 1). These negotiations shape policy formulation, that is, the specific proposals and solutions designed to address the problem. Implementation stages open up further debates not only about policy tools and instruments, but may also see tensions between, on the one hand, formal policy and, on the other, implementation strategies. If policies do not achieve what they are intended to achieve, blame is often not laid on the policy itself, but rather on political or managerial failure in implementing the policy. At the evaluation stage, failure can thus be blamed on a lack of political will, poor management, or shortage of resources, to take typical examples.

Stage 1: agenda setting
Agenda setting refers to the process by which some problems come to public attention at given times and places. Research into agenda setting investigates how issues come to be seen as public issues, and thus as the legitimate business of

Table 1. Negotiating nature through the policy making process.

Stage	Issue	Range of Response
Agenda Setting	Purpose of Restoration	Biodiversity
		Ecological functioning
		Ethical
		Economic
		Cultural
		Visual, e.g., landscape
		Social, e.g., urban renewal
		Leisure
	Focus of Restoration	Industrial/mining
		Urban
		Forests
		Rivers
		Agricultural land
		Marine
		Wetlands
Policy Formulation	Spatial scale	Pragmatic
		Patch
		Landscape
		Ecosystem
	Temporal scale	Output oriented, short term
		Long term
		Historical
		Ecological
	Funding scale	Indifferent to spatial or temporal scale
		Adjusted for spatial and temporal scale
	Funding sources	Public
		Private
		Voluntary contributions
		Mixed
Project Implementation	Location	Imposed from 'top down'
	Technical delivery	Negotiated from 'bottom up'
	Nature of participation	Inclusive
		Expert driven
Evaluation	Criteria of success	Technical
		Historical / Fidelity
		Anthropocentric
		Ecological
		Cost/benefit

government, requiring in turn, public policy solutions (Rochefort 2011). Agenda setting is seen as the first phase of policy making, before formal consideration of policy proposals. Research on agenda setting focuses on the linkages between the social spheres and the polity. It highlights the role of ideas, social conflict, and of current events, as also shaped by media coverage, in the origin and prioritization of public policy issues. In the restoration debates, ecology scientists tend to play a prominent role in identifying when certain species or ecosystems are under pressure or threat, often suggesting specific restoration solutions. Such interventions thus play a key role in defining what the problem is and how it should be resolved. Various modes of defining policy problems can be seen as forming competing languages, in which groups offer and defend conflicting interpretations of the issues (for a fuller discussion, see Fischer 1998). The science-policy interface is important here, shaping to what extent scientific or other technical experts, or lay knowledge plays a role in advising policy makers on what needs to be done and how this is to be achieved.

Such interventions play an important role not least because commitment to environmental protection does not spontaneously generate or even map clearly onto specific ecological restoration projects or initiatives. For example, if the objective of restoration is to restore nature, there are at least three broad definitions of 'naturalness' that can drive policy:

1. naturalness as associated with a state of the environment that existed at some previous point in time, prioritizing restoration aimed at historic fidelity;

2. naturalness as a state of the environment that exits in the absence of human modification, resulting in restoration aimed at rewilding;

3. naturalness as associated with a slow or natural rate of change, such as in ecological cycles, directing restoration toward ensuring ecological function (see Hull and Robertson 2000).

These different states of nature do not offer value-free references for restoration efforts (Hull and Robertson 2000:100). Underlying these different approaches are deep ideological disputes as to the value of restored nature. On the one hand, there is the view that once a system has been created, designed, or managed by human technology and science, it is no longer a natural system; rather it has become an artifact, a product of human intention and design. In this view, nature is compromised by or contaminated through contact with 'community' wherein nature, seen as a repository of intrinsic value, is disrupted by human interference (see Elliot 1982, Katz 2000). For Katz in particular there is a fundamental ontological difference, i.e., difference with respect to essential character, between natural entities and human artifacts. In this view, once we introduce human intentionality and purpose this changes the character of a natural system. There are three characteristics of artifacts that can be used to distinguish the artifactual from the 'natural': origin, historical continuity, and authenticity. Using these criteria, ecological restoration shows a lack of authenticity, an interruption of historical continuity, and a change of origin, all of which arise from the addition of human intentionality (Elliot 1982). More specifically, mitigation restoration, that involves replacing one destroyed ecosystem by restoration measures elsewhere, is seen to deny the place-based and place connectivity of a particular site. Furthermore, such activities are seen as part of the increased humanization of the natural world, (Katz 2000). The belief that restoration can replace natural value by the creation of functionally equivalent natural systems thus becomes an expression of human hubris regarding technical power and mastery of the natural world (Katz 2000). On the one hand, there are those who believe that we can imbue restoration with positive value, even if we cannot undo the past or replicate nature values in its products (Cowell 1993, Higgs 1997, Light 2000). Therefore, even if we agree that humans cannot restore nature, in the absolute sense, it does not follow that society ought not to engage in restoration projects that actually repair the damage caused by past actions (Light 2000). Furthermore, restoration practices can be valued because they can help society construct a positive relationship with nature (Cowell 1993, Higgs 1997, Throop 2000).

It is at the stage of agenda setting that disputes over the meaning and value of restoration can come sharply to the fore and the normative, as opposed to the merely technical, nature of ecological restoration is clearly revealed. In the case of the restoration of habitats for the White-backed Woodpecker (*Dendrocopos leucotos*) in Sweden, which is one of the priority species listed in the above-mentioned Swedish Action Plan for Threatened Species, there are considerable disputes over the extent to which the most suitable habitats must be fully conserved or whether forest management, with appropriate consideration to the wood-pecker's various requirements, might be allowed. The origins of such disputes lie in different understandings of the essential purpose of restoration: maintaining the symbolic/ethical value of the woodpecker itself; restoring its specific habitats in ways that brings benefits to a range of other species; and/or prioritizing the varied ecological services within the entire ecosystem upon which both the woodpecker and other species depend (SEPA 2005). These disputes also involve economic interests because forest owners are rarely prepared to invest in restoration unless they derive some benefits.

The agenda setting stage is also important because it is often at this stage that the governance style starts to take shape, that is, whether ecological restoration is to be driven primarily by hierarchical governance, such as reliance upon rules and legislation, by markets, that is, through the use of economic incentives or voluntary arrangements, or through network styles of governance, that is, through broad engagement of private sector stakeholders and community interests. In the case of the White-backed Woodpecker, the choice of policy instruments to be applied includes setting aside state-funded protected areas, voluntary agreements between the state and forest owners, and/or management recommendations from forest agency advisors. This choice has important consequences for whether and to what extent restoration practices becomes socially accepted. If different interests are allowed to be voiced early in the agenda setting stage, the likelihood increases that conflicting values in restoration goals will be revealed and potentially dealt with early on in the policy making process. The agenda setting stage could also determine who is in and who is out of the subsequent stages of policy.

Stage 2: policy formulation
At the stage of policy formulation, decision makers in the legislature and the bureaucracy take up the issue, formulating legislative, regulatory, or programmatic strategies to address the problem. In an ideal world, restoration at this stage would be driven by the goal of constructing policy and practices that manifests both "high human virtue" and ecological responsibility (Higgs 1997:343), as manifested in the notion of ecological/environmental citizenship (Dobson 2007). This would include the use of the virtue of humility, including recognition of societal dependence on nature; of self-restraint,

in particular in relation to the consumption of natural resources; and of altruism, as principles for promoting sound restoration practices (see Callicot and Nelson 1989, Throop 2000, Ekker 2004). A political science lens shows how restoration policy falls far short of this ideal goal.

First, there is the problem of scale. Conservation ecology has long since been aware of how scale is critical for the success of restoration efforts. Restoration projects aimed at rewilding for example, have been criticized as operating at too small a scale and thus as only representing wilderness and easily dismissed as merely symbolic or ceremonial (Jordan 2000). Similarly, small scale, localized projects run the risk of ignoring higher scale barriers to effective species colonization of, and migration to, the restored site. Social scientists are similarly concerned about how scale can impact upon policy effectiveness. Most obvious is the territorial delimitation of political power, that is, the physical area over which one political structure, rather than another, holds sway (Meadowcroft 2002). There is an obvious mismatch between territorial scale, understood in the political sense, and ecological scale, for example, in relation to a transboundary river system that needs to be restored. This makes it difficult to devise, let alone implement ecological restoration projects across the appropriate ecological scale. The ecological restoration initiative in the transboundary priority conservation area of the Javakheti Highlands, an area of high biodiversity importance that straddles the border area between Turkey, Armenia, and Georgia, provides a case in point. The conservation and restoration strategy for the Javakheti Area forms part of the biodiversity vision for the Caucasus Ecoregion developed in 2003 under the Caucasus Initiative by the three participating countries, under guidance of the World Wide Fund for Nature (WWF) Regional Office. However, the relationship between Armenia and Turkey has resulted in Turkey's failure to become involved in the project. Similarly, restoration initiatives in the Ohrid-Prespa Lakes Region have run afoul of the poor relationship between Greece and Macedonia (Schuerholz 2004). Such complexities arise not just between states in areas of high political conflict, but as a typical part of transboundary resource management, as evident by the legal and policy complexities involved as both Mexico and the United States try to collaborate in the management and restoration of the Colorado River (Pitt 2006).

To further complicate matters, political jurisdictions are divided and combined, typically for example into municipalities, and then regions; or into nation states and then supranational organizations like the EU. These can, in turn, be ordered into nested hierarchies. Furthermore, they can be configured differently for different administrative purposes so that ecological restoration projects can easily fall between the administrative cracks, as it were, and this makes it difficult to reach agreement on how to divide competences and responsibility between the different authorities and to settle matters of budgetary contributions. River restoration generally falls into this trap (Breckenridge 2006), as do restoration of ecosystems for large carnivores. Given these multilevel scales, ecological restoration is likely to encounter problems of manifold interests, conflicting policy goals, and different social expectations both within and between the different levels of governance. Inequality in power structures and relationships between those interests, for instance, when indigenous peoples want to claim their traditional user rights to those ecosystems they depend upon in both economic and cultural terms, poses major challenges in the managing of conflicts as well as in resolving how policies will be formulated in a legitimate and constructive way.

There are similar problems encountered in trying to address matters of temporal scales. From a policy analysis perspective, temporal scales relate to the ebb and flow of events, to continuity and change in government personnel, policies, and institutions, and to regular cycles in political life, such as elections, etc. (Meadowcroft 2002). Furthermore, temporal and spatial scales interact in complex ways, causing issues to rise and fall in policy salience and where public pressure to act varies over time in the light of shifting social concerns, competing political events, and media attention. For example, the dwindling seal population along the Baltic and North Sea coastlines received considerable public attention in the late 1980s, supporting the rise of environmental social movements and eventually to the election of the Green Party into the Swedish Parliament. This in turn helped prioritize restoration on the public policy agenda from the 1990s onward. In contrast, the current financial crisis has seen many restoration initiatives hampered by dwindling financial resources. Local, state, and national watershed restoration efforts in Lake Tahoe in the USA have resulted in one of the largest restoration initiatives in the country. However, the heavy reliance on general funds and general obligation bonds for funding has resulted in financial shortfalls during the current financial downturn. Similar financial problems are currently being experienced by the Comprehensive Everglades Restoration Plan (Hurd 2009). Issue salience, operating at social and political scales, do not necessarily map well on to the ebb and flow of ecological cycles, for example, regeneration cycles within an aquatic or forest ecosystem or cycles between change and stability in an ecosystem. As a result, limited time spans for restoration projects and short-term budgets result in difficulty in mounting longer term monitoring and evaluation programs of ecological restoration efforts. For the White-backed Woodpecker restoration program in Sweden, the current monitoring brings a discouraging message, namely that few new breeding pairs have, as yet, been established despite considerable investments over the last decade. Reorienting the time frame of the world of policy makers can be difficult given that a week is a long time in politics.

This also brings attention to the problem of determining long-term social choices and resource allocations. In restoration initiatives this often entails present day policy makers planning and funding ecological restoration actions that will only accrue results for future generations. For example, the notion of 'all affected interests' when applied to ecological restoration raises the problem of defining both the interests of, and fairness to, both present and future generations (O'Riordan and Jordan 1995). Also, if we are restoring landscapes based on people's historic relationships, and those are changing because of urbanization and new land use patterns, then how do we know what kinds of natural states will be preferred by future generations? Participatory processes in this context have to resolve the issue as to how to ensure that the voice of future generations, as opposed to present interests, is reflected in restoration decisions.

The policy formulation stage also involves choosing the means of influence: the ecological restoration goals may be attained through authority, economic incentives, or market tools, voluntarism or persuasion, or various combinations thereof. Such decisions will influence the potential for implementation, and have bearings also on subsequent monitoring and evaluation. The use, for example, of market tools such as tax incentives may encourage public-private partnerships for project delivery, whereas reliance upon voluntarism may open up opportunities for community or NGO involvement. The latter engagement is, in turn, more likely to require that social or cultural criteria be added to traditional ecological criteria for evaluation of project success.

Stage 3: policy implementation

Defining goals cannot be separated strictly from attaining them, because implementation involves countless decisions that determine, in practice, what pursing these goals actually entails (Sabatier and Mazmanian 1989). The above mentioned Swedish Action Plan for Threatened Species illustrates this situation, as specific targets and measures are required for each and every species to be saved and are implemented on the ground through a range of local public-private partnerships, which bring their own way of operating. However, it is nonetheless useful to distinguish the implementation phase of the policy process and use this as an aid to understanding how the politics of ecological restoration may play out in practice.

Implementation analysts employ either a so-called 'top-down' or a 'bottom-up' implementation perspective, or use a synthesis of these two perspectives, to identify the factors that are considered important in the implementation process (Winter 2006).

Beginning with a top down perspective, policy implementation requires both nonambiguous goals and the identification of effective means. Frequently, inconsistencies arise as policy has to take place in a crowded policy terrain, where different stakeholders may strive for incompatible ends. In practice, policy goals are often formulated imprecisely and subject to varying interpretations across the policy cycles. This was the case in a flood plain restoration project in the UK that relied upon a large number of partners for its implementation, many of whom held different policy priorities (Adams et al. 2005). In addition to the top-down planning emanating from national environmental goals, this project saw safety issues become a major concern to the local community, and landowners' support became critical for project success. Their research into implementation issues led the authors of this UK study to argue that small-scale and site-based floodplain restoration that involves fewer stakeholders has greater chance of success than large catchment based restoration initiatives.

Aside from the requirement that policy goals are nonambiguous, policy makers need to have a clear understanding of the cause-effect linkages when they formulate a policy. In relation to ecological restoration, for example, the relationship between biodiversity and provision of ecosystem services remains uncertain (Naidoo et al. 2008), although policy makers are increasingly attempting to use ecological restoration as a tool for ecosystem service provision. Thus, for example, ecological restoration projects generally constitute the largest category of all the so-called payment for ecosystem services (PES) projects in terms of financial investment and spatial coverage (Wunder et al. 2008), despite the fact that the cause and effect linkage is not fully understood here. The majority of PES in the UK, for example, has focused on improving drinking water, often with the involvement of the water companies. However, the potential for PES schemes to contribute to wider improvements to meet the EU Water Framework Directive and restore and maintain upland peat, have as yet failed to be realized. This is not least because of limited understanding of the role that intact upland systems play in the provision of resilient river systems downstream. Furthermore, there is still need to develop specific codes tailored for use by certain sectors or habitats, for example, a peat land carbon code capable of providing guidance to peat land restoration projects to ensure long-term, additional climate and other benefits while avoiding trade-offs with other ecosystem benefits (Hirst 2012).

Consideration also has to be given to the allocation of expertise and resources alongside the institutional arrangements put in place to ensure effective policy implementation. Research points to the importance of both the availability of funding and leadership in ensuring successful outcomes and in ensuring that restoration projects reflect as wide a set of interests as possible (Adams et al. 2005). Control and coordination become increasingly problematic the greater the number of actors involved in the realization of a particular restoration policy or project, and this can act as a motivation for top-down restrictions on bottom-up engagement. For

instance, a study of public attitudes toward river restoration conducted in three Dutch floodplains revealed three distinct frames that shaped attitudes toward river restoration: (i) an 'attachment frame' focusing on cultural heritage and place attachment; (ii) an 'attractive nature frame' giving emphasis to the intrinsic value of nature; and (iii) a 'rurality frame', focusing on rural values, agriculture, and cultural heritage. Opposition to river restoration was found to stem from within the attachment and rurality frame, in which restoration was seen to threaten the local community's sense of place and agricultural livelihood (Buijs 2009). This means that bottom-up engagement must be carefully managed by top down actors and stresses the importance of well-conceived communication about the purpose and impacts of restoration projects.

Restoration projects are also constrained or controlled by funding in other ways, and it is typical to find that the wishes of groups tend to outrun the available resources. The power to exercise influence over budget allocation becomes very important here in shaping whose interests are realized in implementation processes. In this way, resource constraints effectively serve as a block on interest realization. Implementation researchers thus commonly advise top-down policy makers to ensure that the policy is clear and consistent, with as few links and responsible actors as possible, with adequate capacity and control mechanisms in place throughout the implementation process, and with limited possibilities for external actors to intervene in the process (Hill 2005). Such calls can conflict with the potential for ecological restoration to act as a community activity, thereby restricting the capacity of such voluntary activities to become a source of environmental citizenship, that sees communities exercise political agency through taking responsibility for, and participation in, restoration projects (Light 2006). There is thus a policy tension here: when judged from a narrow policy implementation perspective, limited participation would seem to be preferable; but community practitioners and green theorists alike seek to ensure wide participatory opportunities in ecological restoration so as to raise environmental awareness and to create better relationships between humans and nature (Clewell and Aronsson 2007).

In the implementation of ecological restoration, as in policy making generally, participation has both a normative and functional purpose (Coenen et al. 1998). The normative function relates to enhancing practices of direct democracy. Although democratic theory stresses political equality, and that all citizens should have a say as capable and responsible members of society, the means for achieving this combine direct involvement in substantive decision making with allowing representative elites to make decisions based on free competition and free voting. For restoration practice, the normative stand on participation would imply that the ethics and values that are intrinsic to the setting of restoration goals and means should be subject to transparent and inclusive public debates, also involving political and bureaucratic elites. The functional purpose of participation emphasizes the need for social system survival and justifies participation as empowerment and learning, including as a tool for improving the quality of decisions, as for example, in the implementation of EU nature conservation (Keularz 2009). With this view on participation, restoration policy needs to take different knowledge sources and interests into account so as to improve the likelihood that policies and projects will be legitimate and effective when judged from a range of political, economic, and social concerns. Thus, it is increasingly recognized that successful restoration depends on finding new ways to integrate the science of restoration ecology with local knowledge, or traditional ecological knowledge as it is sometimes known, knowledge based on experience and testimony (Soulé and Lease 1995, Higgs 2005). This broader approach to restoration practices is important in the face of the potential for the increasingly technological constitution of restoration to become the source of local, community opposition. However, participatory practices are not easy and may entail lengthy and resource-consuming processes that could work contrary to efficiency ideals of policy execution. However, such practices also allow issues of risk and uncertainty in restoration policy and projects to be brought to the fore at an early stage, allowing policy makers to consider the alternative pathways and institutional solutions in a balanced and more informed manner. The restoration of Discovery Island, near Victoria, British Columbia, Canada, during the first decade of the 21st century provides a good example of a successful initiative that integrated traditional and scientific knowledge with cultural practices, resulting in both ecological and community improvement (Higgs 2005).

When focusing the analysis of implementation from the 'bottom-up,' the ability to mobilize collaborative networks at the operational level is central. Issue champions, or policy entrepreneurs, may play important roles (Adams et al. 2005). However, even if the goals of such locally induced projects may be highly supported by most of the local community, local actions might not succeed in mobilizing adequate long-term maintenance from the public purse. A survey of the watershed restoration funding in the USA, for example, found that a shortage of funding, alongside a tendency for longer term projects to rely on debt inducing bonds, threatened their long term viability (Hurd 2009). This suggests that restoration initiatives need to be looked at in terms not only of how their goals are formulated, but also how competences and responsibilities are shared or restricted across scale and what capacity for coordination of resources across sectors and levels exists, regardless of whether the goals come from formal policy statements or stem from problem-solving interaction between different local actors.

Stage 4: policy evaluation

Policy evaluation is conducted for the purposes of checking the effects of a policy and for evaluating the policies in terms of necessity, efficiency, validity, etc., but evaluation may also aim for basic knowledge advancement. Evaluation can be both instrumental, to improve cost effectiveness, and be used to enlighten policy makers, to legitimize policy decisions, as well as serve as an interactive or even tactical tool (Vedung 1997). Evaluation is largely driven by the desire to improve public policy making, especially the planning and implementation process. Oftentimes, such reviews follow the rhythm of legislative sessions and state budget-making, so that internal bureaucratic reviews are often coordinated with legislative oversight. Technical monitoring also forms part of evaluation procedures.

However, in the real world of project delivery, normative differences among implementation analysts complicate the understanding of the link between policy intent and policy action. A key issue is whether the evaluation standard should be goal achievement or problem solving. Similarly, there is debate over whether it is the process, the outputs or the outcomes that should form the basis for the evaluation study, as was exemplified above for the Swedish White-backed Woodpecker program. Furthermore, the causal links between implementation and outcomes are commonly affected by other factors beyond the control of a particular formulated policy, which is evident in ecological restoration projects that depend on multiple sectors, administrative scales, and social-ecological interactions. Often, the degree of goal achievement is difficult to evaluate, given the variation in understanding of the goals and the fact that goals may even be invented afterward to legitimize the adopted means. As we have already seen, there are differences of opinion as to the value of ecological restoration, how it is understood, and therefore should be judged. In addition, ecological restoration is driven by a range of objectives, ranging from ecological, such as the maintenance of biodiversity; through to utilitarian, i.e., secure the provision of ecosystem services; the purely social, i.e., promote urban renewal or the provision of opportunities for hunting and fishing; or the spiritual, that is, it can act as a way of negotiating the relationship between ourselves and the rest of nature. Different objectives require different criteria of success. There are also differences within these ranges. For example, adherence to the concept of 'fidelity' as an indicator of success may not be possible, or in the face of climate change, may not be wise. Gunn, for example, argues that, given the extent of environmental destruction and our obligation to respond to this, ecological restoration trumps the matter of whether or not any specific restoration is capable of returning an ecosystem to a former state and therefore this criterion should not be used as a measure of success when evaluating ecological restoration outcomes (Gunn 1991).

With such a diverse and competing set of objectives, the establishment of criteria for success for ecological restoration projects is a daunting and we would say highly political and indeed costly task. This could well explain why monitoring and evaluation of restoration is not commonplace, as evident from a study of U.S. stream restoration where monitoring was required in only 18% of the projects (Bash and Ryan 2002). Similarly, Kondolf et al. (2007) reveal a general lack of systematic assessment of completed projects in their evaluation of two decades of river restoration in California. Evaluating ecological restoration involves making a decision as to the rank ordering of the different objectives listed above. It also involves making a choice between competing views: for example, do we accept Scherer's argument that the return of a functional equivalence to the original ecosystem is all that matters in the determination of value (Scherer 1995)? Or do we adopt Katz's position (2000), which holds that there is a fallacy in the substitution argument: there is loss of value and that restoration of functional equivalence cannot be used as a standard for a positive evaluation of an ecological restoration project because this does not restore the original system? From this perspective, all ecological restoration has to be evaluated negatively.

One possible solution that has been put forward is to use the underlying intention of the restoration as the key to how it is judged. Thus, we could make a distinction between, on the one hand, benevolent restoration, that is, restoration that is undertaken to remedy a past harm done to nature but not offered as a justification for present actions aimed at harming nature; and, on the other, malicious restorations, which involve rationalizing the destruction of nature, through for example, substitution practices in planning decisions. In this approach, human intentionality becomes the key determining factor shaping restoration value and ontological character (Katz 2000). The difficulty with this approach however, is that it assumes the existence of a known and unified intentionality on the part of those involved in an ecological restoration project, an assumption that this policy analysis has undermined.

Aside from this traditional approach to policy evaluation, there is also the possibility of undertaking evaluation in a different way, through using participatory processes. In so-called 'stakeholder evaluation' the assessment is based on the concerns and interests of those parties involved and interested in the program (Vedung 1997). A survey of 317 U.S. river restoration practitioners showed that although ecological degradation motivated most restoration projects, postproject appearance and positive public opinion were the most common metrics of success. Also, projects that were classified as highly effective by the scientists conducting the evaluation had more community involvement and an advisory committee. At the same time, only 10%t of the projects met the idealized criteria

of having clearly defined goals and a set of objective ways of measuring success made prior to project implementation (Bernhardt et al. 2007). This suggests that participatory elements score high in ecological restoration projects, and that cause-effect linkages are rarely predicted in ecological restoration practice.

CONCLUSION

The stages model has advantages, in that it helps reveal how ecological restoration becomes embedded in the policy making process. It is a useful heuristic devise, especially when addressing an interdisciplinary audience. However, this linear model assumes a top-down perspective in which policy makers approach the issue rationally and can come to an agreement that there is adequate information about cause-effect relationships, and that implementing agencies and actors give their support to policies devised further up the line.

As a result of our use of the stages model of policy making, we have shown how ecological restoration involves 'negotiating' nature. Even where there is broad agreement about the need to manage or conserve nature, there is continuing negotiation within the policy making process about how the problem is understood and about specific proposals and solutions to address that problem. Thus, for example, ecological restoration initiatives will typically encounter concerns about the purpose of a restoration initiative, about subsequent use of a restored site, about the extent of public access, as well as about site management strategies. From a policy analysis perspective this negotiation always takes place in the context of different distributions of power, be they resources, or otherwise between the various interest groups and actors involved.

Exploring each of the policy making stages and applying them to the case of ecological restoration has allowed us to highlight how restoration, although a technical task, is also embedded in the murkier world of social and political processes. As Light and Higgs (1996) suggest, there is both the politics in ecological restoration and the politics of restoration. Although the first is about the political issues and choices made when determining what should be done and why, the latter is about how this process is embedded in a wider political, economic, and social context and interrelationship. We have shown that the imperative of ecological restoration, like other policy issues, becomes part of the complex distributions of power operating between the public and private actors involved in the different stages of policy making. The nature of participatory approaches in all stages of the policy process therefore becomes central to the outcome of restoration policies and projects. In subjecting ecological restoration to a policy cycle analysis, we hope to have given the reader insight into how the resulting 'restored nature' is not the product of a sequential application of a formal plan, but the ongoing result of both the intended and unintended consequence of policy engagement.

Responses to this article can be read online at:
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