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Enacting Resilience: a performative account of governing for urban resilience

Hendrik Wagenaar¹ and Cathy Wilkinson²

ABSTRACT

Resilience is an increasingly important urban policy discourse that has been taken up at a rapid pace. Yet there is an apparent gap between the advocacy of social-ecological resilience in scientific literature and its take-up in policy discourse on the one hand, and the demonstrated capacity to govern for resilience in practice on the other. This paper explores this gap by developing a performative account of how social-ecological resilience is dealt with in practice through case study analysis of how protection of biodiversity was negotiated in response to Melbourne's recent metropolitan planning initiative. We suggest that a performative account expands the possible opportunities for governing for social-ecological resilience beyond the concept's use as a metaphor, measurement, cognitive frame or programmatic statement of adaptive management/co-management and has the potential to emerge through what Andrew Pickering has called the everyday "mangle of practice" in response to social-ecological feedback inherent to policy processes.

Key words: social-ecological resilience, practice, urban governance, strategic spatial planning, biodiversity, strategic environmental assessment, Melbourne

1 INTRODUCTION

Resilience is an increasingly important urban policy discourse and has been taken up by international, national and local urban initiatives at a rapid pace (Evans, 2011). Governing for urban resilience informed by a social-ecological resilience perspective means grappling with how to give hand and feet, in real world institutional and ecological environments, to a complex adaptive systems view of the world (Folke, 2006; Wilkinson, 2012a). Social-ecological resilience scholarship urges awareness of this world-view in addressing governance challenges (Folke et al, 2010). However, both the "conceptual clarity" and "practical relevance" of resilience have been questioned (Brand and Jax, 2007). Various efforts have been made to better operationalise a resilience approach (Carpenter et al, 2001; Pickett et al, 2004; Biggs et al, 2009). However, as the field matures and more empirical

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work is published, allegedly findings in practice rarely, if at all, live up to the espoused ideals of governing for social-ecological resilience (eg. Huitema et al, 2009). What we are left with then is an apparent gap between the advocacy of social-ecological resilience in the academic literature and its take-up as a policy discourse on the one hand, and the demonstrated capacity to govern for resilience in practice on the other.

The main argument of this paper is that a performative account of how social-ecological resilience is enacted in practice provides a useful way to help explore the gap between the ideal and practice of governing for resilience. By practice we mean, in an experiential sense, the hundreds of different activities that everyday actors such as administrators, elected officials, planning officials, conservationists and citizens engage in over time to navigate, as well as they can, the everyday world of urban governance. The practice perspective on social action is a broad stream that is fed by many philosophical and theoretical tributaries (Wagenaar and Cook, 2003). Instead of engaging in a debate with these different positions, we decided, given the nature of our case and the purpose of our analysis, to draw on performative perspectives informed in particular by pragmatism (Dewey, 2008 (1925); Bernstein, 2010; Hildebrand, 2003) and the sociology of scientific knowledge (Pickering 1995, Pickering and Guzick 2008;) to critically reflect on resilience approaches to governance.

We develop this critique by exploring how some of the underlying assumptions of social-ecological resilience are dealt with through an empirical analysis of a spatial planning process that triggered the need for an environmental assessment in Melbourne, the capital of the State of Victoria, the south-eastern most state of mainland Australia. The case study examines how protection of biodiversity was negotiated in response to Melbourne's most recent metropolitan planning initiative, Melbourne@5million (DSE 2008) and the subsequent approvals required under Commonwealth environmental legislation. Melbourne@5million triggered the Australian Government's Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) as expansion of growth areas primarily to the west, but also to the north and south-east of Melbourne, threatened matters of national significance including the Natural Temperate Grasslands of the Victorian Volcanic Plain (the grasslands) and several individual protected species including the Golden Sun Moth (*Synemon plana*).

In the next section the theoretical background for the paper is provided. We explain what a performative approach amounts to as well as how it relates to our analysis of governing for social-ecological resilience that is the focus of this paper. In sections three and four we work through two examples from the case to illustrate how some of the underlying assumptions of governing for social-ecological resilience are performed through the typical dynamics of practice. The final section provides a concluding discussion reflecting on critical insights a performative account generates about governing for urban resilience.

2 THEORETICAL BACKGROUND

Performativity and governance

At the heart of a performative approach is the recognition that realities emerge from our practical engagement with the world in an ongoing stream of commonplace, task-oriented, local practices (Wagenaar and Cook, 2003; Snook, 2002, p. 182). We use the plural ‘realities’ to highlight the deep pluralism – political, ideational, ontological - of the world that we inhabit and that is co-produced through our continuous engaging with our material and social environment through practice (Latour, 1987; Pickering, 1995; Wagenaar and Cook, 2003; Law, 2009). Taking a performative approach thus requires a shift from a focus on the representation of knowledge to the insight that knowledge is an aspect, or artifact, of practices, explicable in its terms (Cook and Wagenaar, 2012, p. 16; Abram and Lien, 2011). Arguably, performativity has had its most significant impact ‘in the sociology of scientific knowledge and its destabilization of orthodox notions of knowledge and representation’ (Turnbull 2012, p. 12), as informed by foundational empirical studies of science and technology (Latour and Woolgar, 1979; Latour, 1987; Pickering, 1995). More recently, the import of performativity for governance has begun to be explored through the work of political scientists (eg. Cook and Wagenaar, 2011; Wagenaar, 2011 and 2012), organizational studies (Whittington, 2006; Orlikowski, 2007) and international relations (Adler & Pouliot, 2011).

It is far from easy to summarize the gist of what a practice account, as applied to the governance of resilience, entails. Practice is an amorphous concept with roots in different philosophical traditions and scholarly disciplines (Wagenaar and Cook, 2003). Moreover, and somewhat paradoxically, practice, despite its actionable and pragmatic thrust, is not an instrumental concept. We will see that it evokes ontic, epistemological and ontological dimensions – and controversies - that can only be ignored at one’s own risk. Without touching upon too much specificity, and inspired above all by classical pragmatism and some of its contemporary elaborations, we chose to summarize a performative account in three premises. The first, at the same time the most obvious and most far-reaching, is the primacy of interventionism. This is the insight that reality – that is the environment that we live and move about in and that rubs and brushes against us from all sides, and that we overwhelmingly experience as ‘out there’, largely independent from ourselves - is a product of our ongoing practical engagement with the world (Dewey, 2008 (1925), Hildebrand, 2003; Cook and Wagenaar, 2012; Law, 2009). The second premise concerns temporal emergence. This is the insight that the constraints and affordances of the outer world only come to us through our experience of them in emergent time. The significance of temporal emergence is that two key elements of a practice account that are necessarily connected to each other in the sense that they bring each other into being - time and experience - are folded into it. The third premise regards the interpenetration of the human and the material in the way we act on, and understand, the world (Pickering 1995; Law 2004; Pickering and Guzik 2008). Our aim is to show how a performative account, first, opens up

opportunities for governing for resilience that have so far been overlooked in social-ecological resilience scholarship and, second, helps to explain why realities seem to persistently confound governance efforts.

The first key insight of a performative account taken up in this paper is that we grasp the world by intervening in it. By intervening we mean any activity that purposely aspires to change an aspect of the world (Wagenaar, 2011, p. 60). With this statement we wade into a morass of vexing philosophical issues that we can't even begin to discuss properly within the confines of this paper. Let us just touch upon a few salient aspects. The notion of intervening suggests a fundamental orientation towards reality that the pragmatists call "the practical starting point" (Hildebrand, 2003, p. 185). The practical starting point must be seen in opposition to the 'theoretical starting point', the widely institutionalized attitude that, as the right way to grasp reality consists of analyzing knowledge, reality itself must have a linguistic or conceptual nature (Dewey, 2006, p. 3; Hildebrand, 2003, p. 186; See also Taylor, 1995; Cook and Wagenaar, 2012). The practical starting point on the other hand acknowledges that we grasp the world – practically and cognitively – through our experience of it. That is, we do not begin with a theory or a linguistic frame, but through some less defined, more immediate, experience of the world in which we are immersed (Hacking, 1983, p. 37; Alexander, 1987, p. 89).

However, intervening, as the pragmatist philosophers realized, inevitably provokes resistance. Empirical reality has a way of subverting our best-laid plans and ideas once we act upon it. From an interventionist or performative perspective, the world presents itself as a bundle of affordances and constraints. Our grasp of the world, both in a practical and cognitive sense, as well as in the ontological sense that the world appears to us as a by and large stable, coherent place out there, is produced by our grappling with these affordances and constraints in an actionable manner. Or as Hacking puts it succinctly: "(I) think that reality has more to do with what we do in the world than with what we think about it" (1983, p. 17). The importance of resistance as an ontological aspect of a performative account is that it embodies three key elements of the practical starting point: our purposes with the world as they follow from our needs, desires and valuations, intentionality in other words, the way that the agency of the world subverts our purposes once we act on them, and our understanding of the world, practical and intellectual, that emerges from our probing the patterns of affordance and constraints for the purpose of designing accommodations to resistances that the world has thrown up in response to our acting in it. It is in this sense that we indeed "enact realities" (Law, 2009, p. 13).

The second insight is that acting in and on the world takes place in emergent time. One of the enduring aspects of the theoretical starting point, as exemplified for example in almost all social science research or policy analysis, is its rearview mirror attitude towards time.¹ The theoretical starting point is retroactive; it explains how actors think and decide ex post facto. However in a performative account people live under the imperative to look forward, to act on the situation at hand. Engaging in practice, such as designing and implementing metropolitan expansion under ecological constraints, means to harness uncertainty, complexity,

and the limits of predictability when actions extend in ongoing time. This is a simple but deep requirement. Once all the information on how a particular decision has run its course is in, we can more or less exhaustively explain or give an account of how that decision was made. Much policy analysis, for example, is of this kind. But actors live in a world where the outcome of decisions is generally not immediately or completely known, where problem formulations are unclear and fundamentally contested, where no one can oversee the implications of alternative courses of action, where, in short, the answer to the question “What to do?” is shrouded in fog.

However, emergent time is not simply the admonishment to look forward. In a performative account, time is neither retroactive time, nor the arrangement of pre-existing elements in linear time. Instead, emergent time is becoming through an ongoing engagement with the world. “(Time) never barely is, it always becomes”, as the novelty of the present is created by the very act of becoming (Čapek, 1971, p. 90, 130. *Italics in original*; Wagenaar, 2011, p. 288). The notion of emergent time revolves around ‘experience’, another key concept in the practice account as we saw above. Practice is animated by experience (Wagenaar and Cook, 2012) Our notion of time, our sense that our life is stretched out on a line that extends the present into the past and into the future, is a byproduct of the unfolding of action and the experience of change and novelty that accompanies it (Wagenaar, 2011, p. 287). Our actions are therefore not in time, they are time. In this emergent sense experience is time. However, experience is a notoriously slippery concept (Jay, 2005). We summarize a huge philosophical debate here by taking the position that experience is not a private affective state, but instead straddles the interface of private subjectivity and public language and action (Jay, 2005). Experience is simultaneously immediate, ineffable and shaped by cultural templates. Experience is transactional in that it extends beyond the boundaries of the individual. Transactional experience denotes a relational connection of experience. It is an attempt to connect individual experience with the larger world by encompassing the latter into the former (Alexander, 1987, p. 63). Emergent time is, thus, generative. It tells us that realities are artifacts of temporal emergence, simultaneously stable and provisional, obdurate and temporary, emerging in an “eternally unfolding present” (Cook and Wagenaar, 2012, p. 21; Law, 2009).²

Resistance, as we saw, is not confined to human actors but characterizes both the human and the nonhuman. Sociologists of science argue that it has certain advantages to think of resistances in terms of agency (Pickering, 1995, p.6).³ The advantage is that it allows us to unpack the interactive give and take between people and the world when the first act upon the latter. Our third key insight then is that in a performative account of policy making the world of governance is seen as “a field of powers, capacities and performances” (Pickering, 1995, p. 7) and extends to humans, non-human organisms, and things. As Wagenaar (2012, p. 92) puts it: “The term agency denotes a world in which various agents are continuously doing things; things that bear upon us, that have an impact, and with which we as humans have to grapple and to cope.” Agency is what makes the world “talk back” whenever we intervene (Schön and Rein, 1994) and is the catalyst for the inevitable unintended consequences that public policy must deal with. So when we

send a policy proposal into the world, we have little control over the way in which human, artifactual and natural agency receives and absorbs the policy and spits it back at us in unforeseen ways. (Vickers, 1984; Cook, 2005; Wagenaar 2012).

When we ask the question, “What is it that we do – in a performative sense – when we act in a goal-directed or intentional manner in a world that is filled with agency?”, the answer is that “we try to capture agency” (Pickering, 1995, p. 23; Wagenaar 2012, p. 93). In the next section we will describe the efforts of policy makers to model the location of a threatened ecological community such as the grasslands, only to discover that data from each subsequent field survey challenge the model, necessitating ongoing changes to it. This illustrates what Pickering (1995) calls the dialectic of resistance and accommodation. Pickering (1995, p. 22) defines resistance as “the failure to achieve an intended capture of agency in practice” and accommodation as “an active human strategy of response to resistance, which can include revisions to goals and intentions as well to the material form of the machine in question and to the human frame of gestures and social relations that surround it” (Pickering, 1995, p. 22).

From a performative perspective then a policy practice, such as strategic planning, requires that “we extend our intentions and understandings into this indeterminate world without being able to predict how its agency will effectuate itself and impact us. Knowledge of the world is important, but is only a partial and incomplete guide to our stabs into the future” (Wagenaar 2012, p. 93). Pickering, in discussing the practice of science, is clear about the implications of this and explains, in somewhat overblown language: “There is not a thread in the present that we can hang on to which determines the outcome of cultural extension. We just have to find out, in practice...how the next capture of material agency is to be made and what it will look like.” (1995, p. 24). This tempers the capacity for cognitive knowledge and analytical representations to accurately inform the likely impacts of policy initiatives. Rather, what counts is “the temporary accommodation between intention, intervention and effect in the face of the resistances that the agency of the world throws up” (Wagenaar, 2012, p. 94).

In the remainder of this paper we use this approach to practice theory to analyze a metropolitan planning process where ecological considerations significantly constrained urban development options. This planning effort involved dozens of agencies and actors, both public and corporate, on the national, state and municipal level, each with their own interests and professional specialization. These actors had to resolve how to protect natural temperate grasslands in the face of the need for urban expansion. Knowledge of the grasslands and how they reacted to human intervention was incomplete. We took care to avoid the usual *ex post facto* policy analysis, but instead we aimed to reconstruct as much as possible the activities of the actors from their perspective, with all the associated uncertainties, struggles and improvisations, as they unfolded in emergent time. With respect to research design, performativity requires that we pay close attention to the ‘choreographies of practice’ (Law 2009, p. 13). To this end, the empirical work that informs this paper is based on detailed field-work in Melbourne carried out between 2009-2011 that included qualitative interviews, guided site visits, document analysis as well as

observation of field ecologists, departmental meetings and various stakeholder events.

Governing for social-ecological resilience

In terms of its own vocabulary, social-ecological resilience is concerned with the governance of linked social-ecological systems (Berkes et al, 2003; Gunderson and Holling, 2002; Folke, 2006). Resilience scholars position this focus in contrast to traditional approaches which saw mainstream ecology exclude humans, and social science ignore the environment in its focus on human systems (Berkes et al, 2003, p. 9). Linked social-ecological systems are explicitly framed as complex adaptive systems (Folke 2006), and to better understand the dynamics of such systems is a key focus of resilience scholarship. Research frontiers include the dynamics of thresholds, regime shifts and transitions (eg. Biggs et al, 2009; Folke et al, 2010).

Resilience emphasises a (bio-)regional rather than a local spatial perspective (Holling, 1973) in order to avoid one of the limitations of natural resource management, namely a singular, local perspective of scale (Holling and Meffe, 1996). The need for better cross-scale coordination in the governance of linked social-ecological systems is well recognised (Gunderson and Holling, 2002; Cash et al, 2006). Cross-scale here does not just mean the spatial scale, but also temporal, institutional, and jurisdictional scales (Cash et al, 2006). This means that care must be taken that governance efforts to pursue resilience at one scale do not come at the expense of resilience at lower or higher scales.

In order to deal with complex non-linear dynamics facing irreducible uncertainty, resilience approaches to governance argue for generating adaptive capacity. This includes attention to diversity, disturbance, self-organization and the interaction between these (Folke et al, 2003). Adaptive co-management refers to recent efforts to bring together two emerging programmatic approaches to natural resource management that attempt to deal more effectively with uncertainties and complexities: “co-management” (Holling, 1986), with its attention to user participation in decision-making, and “adaptive management”, with its focus on “learning by doing in a scientific way to deal with uncertainty” (Armitage et al, 2007, p. 1).

What insights can social-ecological resilience scholarship gain from a performative account about governance? Our argument is that a practice perspective can inform our understanding of the apparent gaps between the theory and practice of governing for social-ecological resilience. With respect to practice we suggest that a performative account expands the possible opportunities for governing for social-ecological resilience beyond the concept’s use as a metaphor (Pickett et al, 2004), a measurement (Carpenter et al, 2001), a cognitive frame (Fischer et al, 2009; Wilkinson et al, 2010), or a programmatic statement of adaptive management or co-management (Folke, 2006; Armitage et al, 2009). We want to illustrate how the hustle and bustle of real-world politics and policy making affects the capacity to govern for social-ecological resilience in urban settings. There are few cases in the

literature that provide a practice perspective on social-ecological resilience in urban settings. Where they do exist, they are either not theorized (eg. Wilkinson 2012) or based on reflective insights following one-off intensive workshops (eg. Wilkinson et al, 2010). What we want to provide here instead is a more detailed ethnographic account of what it takes to perform aspects of what we come to recognize as social-ecological resilience through a policy process. What the case shows is that social-ecological resilience is not so much pro-actively pursued as that it emerges in the course of designing and implementing metropolitan expansion while preserving bio-diversity. Some of the underlying foundational assumptions of social-ecological resilience described above are enacted through a struggle with the affordances and constraints of extant laws, regulations, actors' interests and the physical infrastructure of the Melbourne metropolitan area and its natural environment. We think that this is a more realistic form of resilience in ordinary policy settings than the idealized models that the textbooks prescribe.

3.0 'POWERFUL MAPS' AND PERFORMING THE DYNAMICS OF LINKED SOCIAL-ECOLOGICAL SYSTEMS

In this section we will give a performative account of the problem setting phase of the policy process. Understanding the dynamics of linked social-ecological systems is a key step in analysing resilience and thus governing from a resilience perspective. In this first illustration, we will show how the dynamics of such systems (in this case the grasslands) is performed to critically influence the policy processes. We will also show how the capacity for performing the dynamics of the grasslands relies on decades of cumulative experimentation and learning by public administrators and scientists (amongst others) combined with the ability to act on the situation at hand.

The Natural Temperate Grassland of the Victorian Volcanic Plain was listed as a critically endangered ecological community under the EPBC Act on the 21 June 2008. Less than five per cent of the pre-European distribution of this ecological community remains (DSE, 2009, p. 66) with "conservation reserves currently account(ing) for only two per cent of the current extent of native temperate grassland" (DSE, 2009, p. 143). Most of the highest quality remaining grasslands is located to the west of Melbourne and subject to urban growth pressures. Policy Statement 3.8 under the EPBC Act (p. 2) describes the grasslands as follows,

"The vegetation is dominated by a native ground layer of tussock-forming perennial grasses interspersed with a variety of wildflowers. Few, if any, large shrubs and trees are present. The ecological community can vary greatly depending on the time of year and the history of the site, such as intensity of grazing and recent fire history. The native grasses that usually dominate are kangaroo-grass (*Themeda triandra*), wallaby-grasses (*Austrodanthonia* species), spear-grasses (*Austrostipa* species) or tussock-grasses (*Poa* species). Wildflowers and herbs grow among the tussocks, including daisies, lilies, peas and orchids. The grassland supports a variety of nationally threatened animals and more than 20 threatened plants."

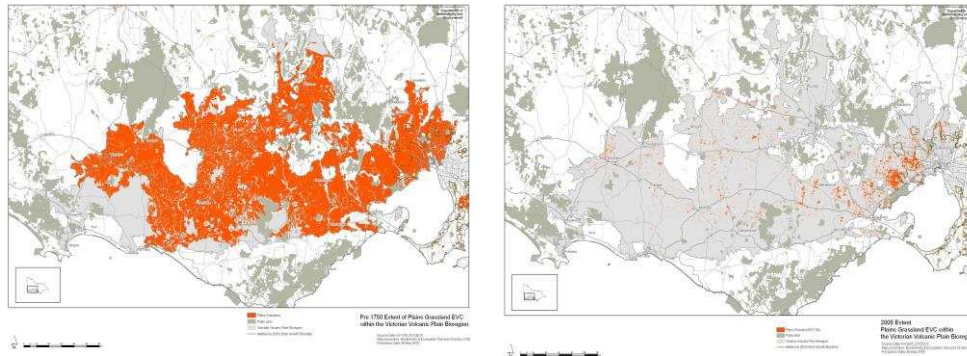
Interviews and extensive documentary evidence showed that policy makers were acutely aware of the social-ecological dynamics that impacted on the grassland habitat adjacent to the urban fringe of Melbourne. Human interventions, including the impact of the cessation of Aboriginal management practices, sheep grazing, ploughing, urban development, rock breaking, as well as driving to the verge of extinction small marsupials, critically affects the grasslands. This awareness of the interaction between social and ecological processes extended across spatial and temporal scale. At the micro scale for example it was recognised that the Striped Legless Lizard (*Delma impar*) needs gaps in dry earth to survive fire, so fire management regimes designed to support regeneration of the grasslands are timed to take this into account by land managers. There are of course considerable uncertainties, both known and unknown. For example, the extent of the Golden Sun Moth's habitat remains unclear and it continues to be found wherever it is surveyed for, including in grasslands dominated by invasive species as well as in domestic gardens.

The immediate policy problem under consideration was how to get the necessary approvals for the metropolitan strategy and proposed urban development given the requirements of the EPBC Act. The Government had “no passionate concern” (in the words of one interviewee) for the grasslands or individual species but because of the EPBC Act “it became obvious” that they must be taken into account, and indeed were central to the policy process. In almost all interviews with Departmental actors they singled out (unprompted) the significant role of the so-called “powerful maps” (see Figure 1) in communicating the centrality of biodiversity considerations to the problem at hand. The following quote is indicative of the sentiment.

“There was a very very very powerful map...It was a very powerful map”

The maps were referred to in interviews as “placemats” ever present on office desks and on the tables at working group meetings. For others it became a permanent fixture on the wall. They were powerful because they captured in a stark visual image the challenges faced, made a strong moral case for action and pointed to a solution. The potential of these maps to tell a story of dynamic change in a linked social-ecological system was recognised by senior executives in the Department of Sustainability and Environment and used to significant effect through the departmental and Government decision-making processes. Most notably they powerfully made the case for a strategic environmental assessment to be pursued, a first for a terrestrial system in Australia.

Figure 1. The “powerful maps” showing the extent of the Plains Grassland Ecological Vegetation Community, pre 1750 and 2005 (Source: DSE 2009).



These maps were an output from a blue sky project pursued by the Arthur Rylah Institute for Environmental Research (ARI) (the biodiversity research base for the Department of Sustainability and Environment) to model the historic extent of the “naturally”-treeless grasslands on the Victorian Volcanic Plain, corresponding to the listed grassland under the EPBC Act. They represent the extent of the grasslands at the point of colonialisation (pre 1750) and at present day (then 2005). In both cases they are performative in so far as they derive their meaning from the ongoing flow of purposeful action. The maps perform so as to mobilise enrolment and ultimately intervention. But this does not mean that the maps drive governance practices. In fact, it is precisely the reverse. The knowledge embedded in the maps cannot be seen apart from the ongoing flow of action. Indeed, it was in response to prompting from policy officers that the ARI started the blue-sky project to map the extent and quality of the grasslands. As the accuracy of the modelling improved, it was again policy officers who saw the potential for a map to influence the policy process. It was the policy process that determined when “products” (ie. maps) had to be produced. The scientists, aware of an impending policy “window” would say to the ecologists,

“Look, we’re going to produce a product, we can’t accept any more data, (so) if you know where good grassland it, and it’s not captured, then we need to know about it.”

Producing the maps involved an ongoing interplay between the policy officers, modellers and ecologists (human agency), the model and the maps (artifactual agency) and the grasslands (natural agency). Temporary stabilisations in the form of maps, as representations, helped “to assemble putative realities” (Law 2009, p.

5). Producing the maps that would ultimately appear in the PowerPoint presentations to senior government officials was a negotiated outcome that involved turning a “shades of grey” thing (with all the associated qualifications of numbers of runs, variance, probability etc.) into a “black and white version” that extended beyond a “science question” and was instead a “political decision”. This illustrates how the maps do not regulate governance activities from a privileged position external to these activities. Instead, the different practices associated with attempts to settle the governance of Melbourne’s grasslands form the necessary conditions for these maps to come into being and to fulfil a performative function. The maps are “actionable understandings” in the “unfolding business” of governing the grasslands (Cook and Wagenaar, 2011, p. 25).

By choosing 1750 (instead of, for example, 1900 or 1950 as the point of contrast), the maps suggested a powerful moral argument: since the point of colonization, the size of the grasslands has diminished dramatically; that is why the EPBC Act requires protection of the remaining remnants. They conveyed the story that humans have had a huge detrimental impact on the grasslands⁴; a story that had meaning as a “dynamic, developmental, (...) taken-for-granted and unproblematic background against which and within which problems and opportunities of community’s practice arise and are dealt with” (Cook and Wagenaar, 2011, p. 23). Against this actionable background it was obvious to all involved that Melbourne’s urban expansion was pushing into the last remaining concentrated pockets of high quality grassland. But importantly it also simply illustrated the potential solution by graphically showing the concentration of high quality grasslands in two areas to the immediate west of the UGB that were to become locations for the new grassland reserves. Condensing the informational and moral complexity of knowing and acting into a single and simple story, it fulfilled a performative function and mobilised attention to a somewhat inconvenient consideration as well as a solution. Here we see the map playing a significant role in the mobilization of actors towards a solution that does not ignore biodiversity. The maps enable a normative leap between thought and action (Schön and Rein, 1994).

From a performative perspective it is important to recognise that how the representational knowledge captured in the maps would play out could not be known in advance. In that sense it was a stab into an unknown future (Pickering 1995, p.52). But the environmental policy officers knew from past experience that biodiversity issues were insufficiently considered in the previous metropolitan strategy because they “didn't have the right information to really intervene in the process.” As a result subsequent environmental policy documents included initiatives to generate the information.

“By 2007 we actually had the model ... we'd actually worked out how to map native grasslands using remote sensing, we'd cracked a method for identifying them. And that resulted in these two maps which look beautiful when they're in colour ... We then had the right kind of information to go to a big process like this and say here is the problem and here is the opportunity to do something really great about itSo when this opportunity came along, when we heard about the transport plan and the idea of population forecasts and the need to expand Melbourne, we said, 'Well, we just need to tell you about this biodiversity story at

the same time.' And people got interested, both in terms of that's a problem that we don't want to get in the way and particularly interested in the aspect of what *might the solution be. And, of course, the solution was a big grassland park.*"

As this quote beautifully illustrates, the knowledge that is embedded in the maps is evoked and deployed within and by way of what the policy makers do. The maps present an "opportunity". They suggest an obvious solution ("of course, the solution was a big grassland park"). They fulfill a rhetorical function in that they help senior executives successfully make the case for the strategic assessment to departmental heads and politicians alike. Even the esthetic quality of the maps, the use of the colour red to indicate the extent of the grassland and the dramatic effect when flicked between in a PowerPoint presentation, works towards their powerful role in making a particular course of action possible. The maps do not underlie action but enable what the policy makers do (Cook and Wagenaar, 2011, p. 27). Furthermore, and to use Pickering's terminology (1995), the earlier resistance to attention to biodiversity in previous metropolitan planning processes provided a catalyst for generation of the maps that came to influence the decision to pursue a strategic environment assessment (an accommodation).

4.0 CROSS-SCALE POLICY COORDINATION, ADAPTIVE CAPACITY AND THE GOLDEN SUN MOTH

This second illustration of performativity focuses on how cross-scale coordination and adaptive capacity, two critical aspects of implementing resilience, were performed through the policy process. Here we focus in particular on one element that came to dominate the strategic environmental assessment process: the preservation of the Golden Sun Moth (GSM). The Golden Sun Moth was one of the many nationally threatened species required to be considered in the assessment process. It was listed under the EPBC Act in 2002 and is

"a medium-sized (wingspan 3.1–3.4 cm), day-flying moth" that has "two discrete life stages: the larval stage, which is spent underground and lasts for two to three years; and the adult stage, which is very brief, typically lasting only one to four days. Disturbance to the population during either stage is likely to disrupt the life cycle of the species" (CoA 2009).

One of the cross-scale governance challenges of conducting a strategic assessment of an extensive policy program such as Melbourne@5million is how to protect species that, unexpectedly, are found in more detailed surveys carried out subsequent to the strategic level agreement. One way this is resolved in the Program Report is by reference to prescriptions for particular species. Prescriptions contain detailed instructions for how that species should be taken into account in the preparation of Precinct Structure Plans including, for example, mandatory

detailed surveys, standards for those surveys, and codification of the conditions under which habitat should be protected, should the species be located.

The Prescription for the GSM was approved on 16 April 2010 by the Australian Government Minister for the Environment pursuant to the endorsed Program Report. The Prescription for the GSM states that habitat for the GSM can be cleared “if the 80% target of ‘protected confirmed high contribution habitat’ has not been reached across the bioregion” and “if the habitat proposed to be cleared is not located within an area of at least 100ha comprising native habitat patches less than 200m apart” (AG 2010).

The first point we want to make is that the policy officers drafting the GSM prescription actively considered the formulation of the prescription as a policy instrument (artificial agency), the ecological characteristics (known and unknown) of the GSM (natural agency), the impact of the prescription on inter-departmental colleagues’ ability to achieve their (sometimes conflicting) policy objectives, and its feasibility for planning and environmental consultants who would be required to act on it (human agency). Time and again interviewees talked about the need for a pragmatic approach to getting on and solving novel policy problems that were brought about by the GSM prescription. Indeed the environmental policy officers were described by senior executives as being “practiced in their art of pragmatic ecology”. But what does pragmatism mean here? In general terms it means that these officials are aware that they are confronted with conflicting constraints and resistances. Accommodation of these requires the alignment of the heterogeneous elements of the situation at hand in a solution that, for the time being at least, makes sense to the participants and is deemed workable (Pickering, 1995, p. 29). This is achieved through practical judgments (Beiner, 1983, pp. 130-135), through a willingness to sacrifice the attainment of one objective to obtain an acceptable “level” of, or more of, the others.⁵

The drafting of prescriptions involves environmental policy officers sitting in a room with “all the technical stuff we’d amassed about what we know, what we don’t know”, attempting to “make sense of it” and trying to generate a draft of codified rules sufficiently robust to test more widely. Despite trying to be “as rational as possible”, “as concrete and sensible as we can”, codifying this complex and uncertain ecological knowledge is far from straightforward. One challenge was the inherent uncertainty of the ecological knowledge. In spite of “terrific databases”, the knowledge captured therein was “a drop in the ocean in terms of actually trying to be certain about where the threatened species probably is... (and probably isn’t”. Furthermore, even with “newer models, mathematical models that can predict the way things are, that model is only as good as the data that could change tomorrow because we have different data.” As one interviewee summarises,

"(T)his is a very uncertain stuff we deal with. Even if we did a survey today, we *couldn't guarantee we've found everything*. And something will certainly pop up somewhere down the track... Who will use absolute precision, absolute understanding, absolute *certainty*, *that's one of the big challenges here that,*

sure, we can sell certainty as hard as we can flog it, but inevitably, there's going to be a list of surprises. We're just trying to build the system so that they can cope with the few of the surprises along the way."

What this quote captures is the tension between two powerful constraints in the governance process. On the one hand officials needed to take into account individual species in response to site survey data that were not always available to inform the strategic level decisions about urban development captured in the Program Report. In that process they have to allow for considerable uncertainties and "inevitable surprises" regarding the GSM. On the other hand, they realize that they have to deliver reasonable certainty to the participants in the overall urban development process. Reasonable certainty in this case relates to the promise of streamlined and predictable administrative process and efficient urban development. As our interviews showed, the policy officers drafted the GSM prescription with a ample awareness of this tension. In addition, these experienced policy officers know that such generalized rules are but a poor fit for the urban-ecological complexity of the real world. The approval of the prescription is a temporary stabilisation. Significantly, however, no one can know for sure if, how, where, or when it will be triggered, or to what effect.

To the irony of all involved, this delicate tension came to a head in the very first Precinct Structure Plan subject to the prescription. The GSM prescription was triggered by the Trugganina South Precinct Structure Plan as "GSM habitat within the Precinct was within 200 metres of other GSM habitat outside of the precinct, and that combined area was greater than 100 ha." (Kirsch and Brewin, 2011, p. 26). So here was the very first precinct plan to be tested under the new streamlined approach "bumping into the Golden Sun Moth". In the words of one interviewee that captured the sentiment of most participants, "All hell broke loose".

At the Panel Hearing the 200 metre requirement became a moot point. The 200 meter requirement was written into the prescription as adult males "are unlikely to travel more than 100 m away from suitable habitat patches" and therefore "populations separated by distances greater than 200 m can therefore be considered effectively isolated" (the females are poor fliers, and most likely walk between tussocks of grass) (AG 2010). However, the connectivity of the two parcels in this case was across a planned six lane arterial road. Could a GSM cross a six-lane highway?

The final decision was that the prescription must be taken into account and a large conservation reserve was excised from the area planned for urban development. This led to questions about just how many precinct plans would trigger the prescriptions and to concerns that the prescription would lead to a "Swiss cheese" approach to urban development, seriously undermining the ability to deliver viable urban development. Furthermore, it exposed misunderstandings within the development industry. Assuming that the Strategic Assessment provided the necessary certainty within the UGB of the right to clear vegetation (provided that appropriate offsets were purchased), developers expressed surprise that more detailed matters needed further consideration at all. The Trugganina case showed

this assumption was wrong in the face of the natural agency of the unpredictable GSM habitat distribution.

Despite much intense politics and being “just about killed as a program several times over”, by early 2011 some degree of acceptance of the new policy framework was achieved. The codified rule set and associated promise of administrative efficiency (ie. ability to avoid one-on-one negotiation of project developers with the Australian Government for actions triggering the EPBC Act) provided the necessary certainty for proponents. As one interviewee explained, the “same people six months ago (who were) telling us that this was the end of civilization as we knew it” are now spending a hundred thousand dollars working with consultants to do their own biodiversity plans and draft precinct structure plans that are “actually very good”. They are “not arguing about the areas that have to be protected” and the considerable opportunity costs associated with this, or about having to pay a million dollars for native vegetation offsets. As one interview explained,

“That’s the ultimate sign of success. It’s the manifestation of the certainty that has been provided to these people. As we should all know that’s one of their big drivers. They want to know early, and they don’t really care whether it’s yes or no as long as it’s early. And if they can then factor that into their design it becomes part of their due diligence, part of their costings, and then they are probably going to be able to live with it.”

Here we have illustrated some of the dynamics involved in a typical policy process. The case of the Golden Sun Moth Prescription shows that the need for codification of ecological considerations across scales must be seen in the light of the overwhelming uncertainty that is introduced into the urban development process by the policy goal of protecting threatened species. The inability to predict where the GSM would appear, and the lack of knowledge about its habitat, requires ongoing adaptive capacity in the policy process. However, this kind of administrative improvisation initially created unacceptable levels of uncertainty for the developers. The solution was to stabilize the situation through a certain amount of procedural codification in the form of the prescription. These formalized rules and procedures embodied the situated knowledge and experience of the officials involved, while at the same time they functioned to domesticate the basic uncertainty that is inherent to social-ecological governance and allowed for a level of administrative predictability that was sufficient for investment decisions. The case illustrates that procedural codification through drawing up of formal GSM prescriptions is not the dull work of administrators in back offices. Instead we saw that the prescriptions emerged from a period of intense interventionist grappling with a conflicting and unstable environment. Moreover the case illustrates how understandings that were fashioned at the strategic, political level have to be adjusted by events that happen at the micro-level, and vice versa, how struggling with micro-level “backtalk” is informed by strategic considerations. If, as the resilience literature suggests, governing for social-ecological resilience requires attention to cross-scale dynamics, then unpacking how these dynamics are dealt with in practice in actionable terms is essential.

5.0 CONCLUDING DISCUSSION: ENACTING RESILIENCE

The purpose of this paper has been to provide a performative account of governing for urban resilience with the intent of generating insights into the apparent gap between the ideal and practice of governing for social-ecological resilience.

Resilience is being rapidly taken up as an urban policy discourse. As more and more public administrators turn to resilience as a frame for urban and environmental policy the question of how to govern from a resilience perspective is raised. The scientific literature on social-ecological resilience approaches to governance is dominated by empirical research on adaptive management and adaptive co-management, albeit little if any of this is focused on urban systems. Adaptive management/co-management attempts to be responsive to the complexities and uncertainties inherent in governing natural resources by injecting the procedures and epistemological standards of science into politics through processes of scientific learning by doing. In this way “politics” is supposed to be tamed and systematic learning in the service of controlled adaptation of the governance process to changes in the socio-ecological environment enhanced (Armitage et al., 2009). The result however is an overly stylized depiction of the policy process that is at a remove from the hustle and bustle of real-world politics. This, in turn, leads to criticisms that adaptive management fails to take the political and power aspects of governance into account (Voß & Bornemann, 2011) and doesn't live up to its ideal in practice (Huiteima et al 2009).

We have not drawn on empirical research of a case of adaptive management/co-management, nor even a case where resilience was being explicitly pursued as a policy objective. Nevertheless, by taking a practice-oriented approach to our examination of the Melbourne strategic environmental assessment, we have been able to show how various aspects of a social-ecological resilience approach were performed in the course of acting on the policy problem at hand. We used the examples of the “powerful maps” and the Golden Sun Moth prescription to illustrate how some of the key elements of a resilience approach to governance – including reflexive learning, attention to the dynamics of linked social-ecological systems, cross-scale coordination and adaptive capacity – were enacted in the everyday flow of work in the offices of the administrators, officials, and planners of Melbourne who grappled with the vexing challenge of reconciling urban development with habitat protection. These aspects of resilience were evident in the countless activities of these actors who designed and implemented measures that consistently took both urban development and habitat protection into account. These measures were not designed as a blueprint of governing for resilience, but ensued from an uneasy alliance of intention and emergent effect; partly willed and partly fortuitous. Or, in Pickering's words, we showed how governance consistent with social-ecological resilience has the potential to derive from the everyday “mangle of practice” in response to ongoing feedback between human, natural and artifactual agency inherent to every policy process and not just those formalized as so-called adaptive management/co-management processes. Furthermore we

showed how this takes place in an “eternally unfolding present” (Cook and Wagenaar 2012).

So what can be gained by the idea of performing or enacting resilience?⁶ What the case reveals is that governing for resilience requires not so much the infusion of an epistemology of science into public policy, as the literature has it, but instead more attention to how an epistemology of practice challenges supposedly ‘scientific’ attempts to govern. Perhaps it is better to speak of the ‘acknowledgement’ of a practical, performative orientation, as the professionals and administrators who were charged with reconciling urban development with habitat conservation in Melbourne were fully attuned to the demands of their task. As our research shows, they were aware that there were no blueprints for this kind of policy, despite a considerable literature on governing for resilience. They realized they had to act on the situation at hand and capitalize on the opportunities for learning that this interventionist approach offered them. In this way they found out that a pair of well-designed maps, made possible by advancing GIS technologies, allowed them to make a powerful rhetorical argument that, for the time being at least, stabilized the challenge to convince others of the need for habitat conservation. This allowed these professionals to design measures for aligning the need for urban development with the requirements of conservation of the fragile grasslands and their vegetation. At this point, the professionals were rudely reminded of the indelible agency of natural systems. The Golden Sun Moth presented a typical wicked problem: to advance a feasible course of action without a sufficient knowledge base, in a situation that is characterized by unpredictability and irreconcilable but equally legitimate demands, and that requires the coordination of activities across scales of governance. In a series of successive actionable ‘stabs into the future’ the administrators learned enough about the situation to bring its different elements into a sufficient measure of alignment to allow developers to work while respecting GSM habitat. Central in this solution was the drawing up of formal prescriptions that simultaneously embodied local knowledge from the field and acknowledged the development industry’s need for sufficient predictability to allow investment decisions.

We have analyzed the emergence of a real-world approach to governing for resilience – without assuming that the actors were aware of the concepts and categories that constitute resiliency theory. This, in our opinion, is what distinguishes a conventional analysis of public policy from a practice-based analysis. While the first looks backwards and assumes that the categories of theory are to be found in the world, the second looks forward into emergent time and grasps how policy understandings emerge in the course of acting on the situation at hand. What we recognize in hindsight as a policy, or a resilience approach to governance, is the aggregate result of a loose and shifting collection of actors who are oriented to each other: through shared intentions, through a more or less shared understanding to the problem they have to address, and through artifacts such as maps or procedures. Governing for resilience in this sense is an accomplishment that has to be generated each time in novel situations by people acting together and aligning their actions in emergent time, in a process of organized improvisation (Barnes, 2001). This is what the ‘practical starting point’ entails. But, even more

important, we understand what resilience entails, not as a technical-scientific project, but as an integral part of a democratic, collective problem solving process. Such a performative approach would create opportunities for reflexivity, participation and democratic deliberation (Ansell, 2011) This is what we mean when in the title we talk of enacting resilience.

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NOTES

¹ This term was suggested by Noam Cook. Interestingly, the retroactive nature of policy analysis applies both to traditional empiricist as well as ‘postmodern’ interpretive analysis (Wagenaar, 2011, 295).

² Cook and Wagenaar, in their 2012 paper, draw upon the work of the Japanese philosopher Kitaro Nishida.

³ The idea is hardly new and has been articulated, as Cook (2006) points out, in socio-technical systems theory during and after WWII. As he says: “(T)he key idea was, for a given task, to see both devices and people as a functioning unit, and to apply this perspective to the conception, design, application and assessment of what was then taken to be a socio-technical system” (2006, p. 3). Scholars working in the Actor-Network tradition push this observation into a rare metaphysical realm, however, by giving equal treatment to human and non-human actors in analyzing the composition of the world. They argue the world is semiotically ‘assembled’ in ever-shifting relation between people (and their symbolic renderings of the world) and materiality (Callon, 1986; Latour, 1987). The difference with socio-technical systems theory is that, in its urge to dispel any anthropocentric connotations, ANT poses a complete symmetry or interchangeability between the human and material realm. We believe that this is an untenable position as human agents are appreciably different from material agents in that they exhibit intentionality (See also Pickering, 1995, p. 15). And, as our discussion of experience demonstrated, pragmatist inspired practice theory transcends the human-material dichotomy in a different, to our minds, more productive way. So, instead we follow Cook’s merger of socio-technical systems and practice theory in distinguishing between natural, artifactual and social systems (2006, p. 5). The ground for distinguishing them is that each is distinct with respect to “its requirements for sustenance and stability”. (Cook, 2004, p. 7) It is not difficult to see that each system exerts agency over the others. The three systems cannot be reduced to each other and each system has an autonomous impact on the other in that requires the other to cope with its effects (Wagenaar, 2012, p. 92).

⁴ As explained by one of the interviewees, the spatial pattern of depletion showing on the maps is not random. It reflects land use patterns (grazing, clearing, etc), which are human decisions made in response to the environment (soil type, slope, recent rainfall), with both social and ecological consequences. The fact that most of the remaining grasslands are near Melbourne demonstrates specific social-ecological relationships: 1) the environment near Melbourne is less suitable for agriculture than the rest of the bioregion (low rainfall, rocky terrain), 2) recent land speculation has made intensive farming less likely in this area, 3) very early settlement by squatters near Melbourne and Geelong resulted in large valuable holdings, not intensive farms.

⁵ It goes too far here to elaborate on the dynamics of practical judgment. Beiner’s excellent monograph provide a good overview. Apart from the improvisatory character of practical judgment, which according to Beiner can only be achieved by thorough experience with the substantive domain and deep immersion into the situation at hand, practical judgment also involves an important personal dimension. As Beiner explains, in making judgments we, implicitly, put ourselves

on the line, the quality and integrity of ourselves as reliable, capable professionals. This then implies that practical judgment is “integrally bound up with responsibility and commitment” (1983, p.137).

⁶ After Abram and Lien 2011.