

**Navigating pathways through complex systems of
interacting problems: strategic management of native
vegetation policy**

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Abstract

This thesis is about strategic management in natural resource and environmental policy. It is proposed that natural resource and environmental policy is about managing a complex system of changing problems that interact with each other. This means that cause-effect relationships can be circular, dynamic and difficult to identify and that individual problems can be seen as a symptom of many interrelated problems. It also means that small changes in management practices can lead to large and potentially irreversible outcomes, while large changes in management practices can lead to outcomes that are temporary and inconsequential. The thought of managing such systems can become rapidly overwhelming as they are so multifaceted and have such long term and serious consequences; everything is connected to everything else and the more you learn about them the more you realise how much you don't know. Under these conditions it can be difficult to identify which problems and interactions are most important to monitor and address at any given time.

Examples of potentially important problems include: balancing multiple and competing community perspectives on what policy goals are important to aim for; co-ordinating the activities of multiple and diverse public and private organisations in the pursuit of policy goals; meeting the expectations of stakeholders in the process of policy formulation and implementation; and managing human-environment interactions when scientific knowledge about the dynamics of ecological systems at different spatial and temporal scales is uncertain and incomplete. These problems can themselves be thought of as sub-systems of interacting problems with constituent problems interacting within and among sub-systems. It is not surprising then that the issue of managing natural resource and environmental systems has become widely regarded as wicked or messy.

Increasing recognition of the complex and dynamic nature of natural resource and environmental policy systems has been reflected in an increasing body of literature on adaptive management and integrated management in these systems. While the emphasis

in adaptive management is on recognising uncertainty and ensuring that policy processes are sufficiently flexible to allow them to evolve over time in light of evolving knowledge, the emphasis in integrated management is on accounting for the interrelationships that exist among different natural resource and environmental problems so as to make the most of the benefits and minimise the costs associated with co-ordinated action to ameliorate them.

However, a review of the literature on integrated and adaptive management suggests that they have evolved as two separate management paradigms in the realm of natural resource and environmental policy. As a result there is a substantive gap in knowledge about how problems associated with integration and problems associated with adaptability might interact with each other, as well as with other sorts of problems in natural resource and environmental policy systems. It follows that there is also a gap in knowledge of the implications of such interactions for the pursuit of policy goals. These gaps in knowledge were the focus in this study.

The aim in this study was to develop and explore the value of an analytical approach for: 1. identifying the system of problems relevant to the pursuit of policy goals in a particular natural resource and environmental policy context; 2. identifying the interactions among them; and 3. identifying which problems and interactions would be critically important to address in the pursuit of policy goals. The policy context chosen for the study was the conservation of native vegetation Victoria.

Complexity Theory was adopted as the overarching theoretical framework for the study as it provided a systematic and holistic framework for identifying and analysing the system of problems related to the policy context under study. Moreover, it provided a framework for understanding the dynamics of the policy system and the implications of these dynamics for strategic management.

Following from this framework, the methodological approach adopted in the study was strongly grounded in the individual perspectives of the people involved in the policy

process. These perspectives were elicited through relatively unstructured personal interviews throughout the research process. Earlier in the study, knowledge elicited from participants informed the selection of a policy initiative around which to focus the study, the selection of a case study region, and the selection of people involved in the policy process to interview. Later in the study, in-depth interviews were conducted with people in a range of roles throughout the policy process. The aim in these interviews was to elicit the system of problems of concern to each participant given their role in the policy process. On the basis of these interviews causal maps were constructed to represent the causal logic underpinning the problems and interactions that the participants had discussed.

An in-depth interpretive analysis was then presented for ten of these causal maps. The aims in this analysis were as follows. The first was to identify which problems represented critical leverage points in the policy system. These were points where management intervention could flow on to produce a chain of events that would either hamper or promote the realisation of policy goals. They were also points where management intervention could affect the dynamics of system behaviour so as to promote stability or instability. The second was to identify which problems represented critical constraints. These constraints were points in the policy system that set limits on potential management options. The third and final aim in the interpretive analysis was to draw conclusions about the critical leverage points and constraints identified for the strategic management of the policy system under study.

The findings indicated that the policy system under study was characterised by a dynamic tension between stability and instability, predictability and unpredictability, control and uncontrollability and therefore, between integration and adaptability. Furthermore, they suggested that these tensions differed for different parts of the system, for different behaviours and were subject to change over time. By classifying critical decision points as either stabilising or destabilising it was shown that there were some points in the system where it would be advantageous, in terms of policy outcomes, to engender instability in the system and therefore enhance adaptability. Conversely there were other

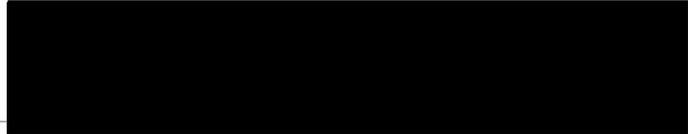
points in the system where it would be advantageous to engender stability and therefore enhance integration.

Methodologically the findings indicated that the coherent picture of the management implications that can be built up using this approach could be used to discover opportunities for identifying and managing the system of problems that are detracting from, or contributing to, the capacity to realise policy goals.

Certification

I certify that the substance of this thesis has not already been submitted for any degree and is not currently being submitted for any other degree or qualification.

I certify that any help received in preparing this thesis, and all sources used, have been acknowledged in this thesis.

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Signature

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